Easy Image Retouching and Restoration for Librarians, Archivists, and Teachers

## Ernest Perez









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## **Ernest Perez**



#### First printing

#### Digital Photo Magic: Easy Image Retouching and Restoration for Librarians, Archivists, and Teachers

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#### Library of Congress Cataloging-in-Publication Data

Perez, Ernest Raoul, author.

Digital photo magic : easy image retouching and restoration for librarians, archivists, and teachers / by Ernest Perez. pages cm Includes bibliographical references and index.

ISBN 978-1-57387-513-4 1. Photography—Retouching. 2. Photography—Digital techniques. 3. Photography in education. I. Title. TR310.P47 2016 770—dc23

2015031259

Printed and bound in the United States of America

President and CEO: Thomas H. Hogan, Sr. Editor-in-Chief and Publisher: John B. Bryans Production Manager: Tiffany Chamenko Indexer: Nan Badgett, dba Wordability

Interior Design by Amnet Systems Cover Design by Dana Stevenson

### infotoday.com

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## **Preface**

The book you are holding describes and teaches what I call "Digital Photo Magic," or DPM—an inexpensive and simple, yet productive and powerful approach to retouching, repairing, and restoring digitized photographs and other images. I wrote the book specifically for the benefit of information professionals and other knowledge workers in libraries, archives, museums, and schools, but it should be useful to anyone who works frequently with digital images or who may be preparing to undertake an image restoration project.

There's no formidable learning curve for DPM retouching technology. It's an easy-to-understand, easy-to-use, intuitive approach to photo editing. The time required to learn how to use the recommended software tools is measured in single-digit hours and days. There's no intensive study, no tutorials, no poring over manuals, and no need to sit through lengthy seminars or training programs.

I should mention here that my coverage is limited to Windows-compatible environments. While there are many terrific tools available for the Macintosh, Mac users will need to look elsewhere for guidance.

You'll find my tone informal and, I hope, helpful throughout. I begin by explaining the DPM concept and approach in the book's Introduction, followed by Chapter 1, where you'll read about many of the effective, productive, and rewarding aspects of DPM for professionals in the target fields. I then progress through clear explanations of digital photo technology, retouching, and digital scanning operations, along with coverage of basic work planning techniques and the importance of designing an effective workflow.

In Chapter 5, I list and describe a number of recommended software products, calling attention to their particular capabilities and strengths. I describe commonly used photo-editing processes in Chapter 6, along with illustrated step-by-step examples of photo-editing tasks and procedures. I also provide extensive and easy-to-follow coverage of cost and equipment issues.

The DPM concept hinges on the use of readily available free and low-cost photo-editing software, apps, and utilities. The emphasis is on products that are easy to learn and use, and on an organized, common-sense approach to processing and workflow. DPM avoids complicated, hard-to-learn, and, in some cases, expensive post-processing software applications such as Adobe Photoshop and the free GIMP package. Learning to use these complex applications skillfully can present a serious challenge for the average non-techie user.

The DPM software tools I recommend are remarkably robust. The developers of these programs have successfully combined high-horsepower editing functions with clear, simple controls and intuitive user interfaces. You'll be surprised how easy it is to do high-quality photo retouching and restoration—even if you *aren't* an advanced computer user. If you can master the basics of word processing and spreadsheet software, you have what it takes to effectively retouch, repair, and restore digital images.

Digital Photo Magic will show you how to do it cheaply, quickly, and easily.

## About the DPM Website

www.update4dpm.com

The *Digital Photo Magic* (DPM) companion website augments and updates information provided in the book and offers a conveniently organized and hyperlinked list of recommended DPM resources. Designed as a bonus for *Digital Photo Magic* readers, it emphasizes software and hardware products for library, archives, museum, and teaching professionals who need a quick and easy path to do-it-yourself digital photo retouching and restoration.

In addition to listing and linking the DPM products and services covered in the book, the website provides pointers to new DPM applications, hardware, post-processing techniques, and related topics by featuring the following:

- A periodically updated organized collection of links to websites that provide information about DPM techniques, trends, and products
- Concise summary reviews of DPM-recommended software products; reviews may include my original (and updated) evaluations and ratings as well as comments contributed by readers like you
- A discussion area where readers can exchange ideas, opinions, suggestions, questions, and answers

I intend to update and maintain the companion website as a resource for as long as *Digital Photo Magic* readers continue their interest in this book and the solutions it offers. Please send your comments, questions, and suggestions to author@update4dpm.com.

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### Introduction

Digital Photo Magic—What's It All About?

The world of photography changed drastically with the introduction of digital technology. Not only are people taking more photos than ever, but we've moved from using chemistry operations and manual processing into an environment of advanced personal computer hardware and software tools used to process our photographic images. In today's world, there's no more darkroom work for developing silver-based photo prints. And there's even more relief for the more exacting and time-consuming processing of color images: For color photographs, digital image processing has eliminated the need for precise timing, exacting temperature controls of chemical solutions, and intricate optical color filtration operations using glass filters.

#### Meeting the Needs of Libraries, Archives, Museums, and Schools

Libraries, archives, museums, and schools have incorporated photographs in their collections, exhibitions, and learning activities for as long as people have been taking them. Today, as digital technology proliferates and the number of available images increases exponentially, staff in these organizations are increasingly being called upon to make decisions about digitization, preservation, and restoration. They are expected to effectively support digital photo operations within prevailing budgetary guidelines, so a working knowledge of current technologies and processes is becoming more and more important, because most of these professionals have had little or no training in digital image retouching, restoring, and processing—in short, they are in need of some guidance.

That's the need I address in this book.

In much the same way that photographic processing technology evolved beyond the use of complex and demanding silver-based chemistry, digital photo-editing or "post-processing" software technology has now moved past the stage at which only computer geeks were able to use it.

"Post-processing" is the technical term for using digital photo-editing tools to change or manipulate photographic images. With post-processing, you can correct or improve full photo images or parts of images. You can apply unusual graphic or artistic effects, such as posterization, high contrast, geometrical pattern overlays, and more.

In just the first half of the current decade, we've witnessed the introduction of an array of powerful digital photo software applications that almost anyone can master. This new breed of photoprocessing software is characterized by reasonable pricing and intuitive, easy-to-learn user interfaces. It's also preserved the digital editing power of high-priced, hard-to-learn professional products, equipping the average user with seemingly magical powers for transforming digital images. The speed and ease of changing an image makes me think of a magician's sleight of hand. It's with this metaphor in mind—and tongue firmly in cheek—that I use the term "Digital Photo Magic" (DPM) to describe what these wonderful tools let us do.

With DPM software, photographic post-processing has progressed to a WYSIWYG (what you see is what you get) style of editing that recalls the evolution of word processing and database software. The makers of these software tools have combined work process simplification with the addition of personal computer horsepower that significantly expands the average user's output capability.

DPM software strips away the need to master laborious and complicated technical procedures and editing operations. It allows the user to do faster, easier, more economical, and higher-quality photo-editing work than most professionals could have done just a handful of years ago. If you work with digital images, you can now benefit from the same productivity and quality improvements that word processing, database, and spreadsheet software programs have brought to office workplaces over the last few decades.

There's still one undeniable fact: *You absolutely, positively need to start with good photographic images in order to produce quality digital output.* Appealing photographs ultimately depend upon a skilled individual who has juggled and coordinated a spectrum of near-simultaneous activities and processes. The photographer must first conceptualize the final image he or she wants, then perform the multitasking magic of coordinating an enormous spread of mechanical and stylistic decisions that include proper lens and focal length selection, exposure setting, depth of focus adjustment, precise focusing, selection of camera-to-subject distance and viewpoint, and skillful visual formatting and composition of the image. Above all, the photographer needs precise timing to "capture the decisive moment." Not at all an easy task, despite the remarkable technological strides made by camera manufacturers that continue apace.

No way around it: Image quality is tied to photographer competence. I don't attempt to deal with the complexity of that wider topic in *Digital Photo Magic*: If you require knowledge of the overall craft of the photographic art, you'll need to gain it through study and practice. There are many publications and information resources available to help you, but this book is not one of them.

I cover Windows-compatible tools and techniques that you can use to do basic and effective photo image retouching and restoration. You can apply this new knowledge in a variety of ways, enhancing a library or museum exhibit, aiding teaching, designing an archives publication or display, or creating a website or other electronic display. DPM can provide professionals and technical specialists with the skills, resources, and confidence to produce high-quality digital images for a wide range of organizational purposes. When working with graphic images, you'll occasionally be faced with a problem in visual quality of an image. Whatever it may be, you must spot it using your own personal and critical visual perception. You need to use and trust your subjective eyeball evaluation here; it's a case of knowing it when you see it. If an image isn't up to snuff for the intended use, it's your job to recognize, address, and cure the problem. This is an essential talent for any prospective post-processing specialist.

The good news is that DPM software can easily correct or minimize most of the technical and accidental errors that cause or contribute to poor photographic image quality. A variety of factors in photographic exposure or processing can result in a low-quality image. An image may be over- or underexposed. It may be too flat or dull or too contrast either in the original exposure or as a result of errors during printing. An image may be marred by spots, scratches, stains, folds, tears, or abrasions, particularly in the case of a historical or antique image or illustration. No matter the cause, your visual problem boils down to something not being quite right with the image. After you have determined that some level of retouching or restoration is necessary, DPM will almost always provide a workable solution. Remember—no matter how bad a photo image may be, you should always be able to greatly improve it.

In Figure A, we're looking at a simple backyard Halloween snapshot; perhaps we'd like to turn it into an informal portrait of the individual pictured. Using DPM, it's surprisingly easy to remove the distracting pumpkin and witch's hat to produce the portrait shot shown in Figure B.

You may be surprised to learn that the physical format of an original image you wish to improve is basically irrelevant. Almost any image representation will do; essentially, you just need to be able

#### Introduction 3



**Figures A,B** A backyard Halloween get-together snapshot is transformed into an attractive informal portrait by removing the plastic pumpkin and witch's hat distracting from the subject, followed by a bit of cosmetic retouching. (Work performed using Inpaint, Retouch Pilot, and Beautune in 15–20 minutes.)

to see it. You can begin from a digital image, a film negative or color transparency, a photo print, a printed or published image from a book or periodical, or even a computer or video display. DPM can handle all of these.

If you already have a digital image, you can start right off editing; otherwise, you can use a scanner or digital camera to convert one from another format. Unlike copying with film and chemical print processing, digital conversion is fast, easy, and inexpensive. No more than a few minutes of work is required to transform any image into a digital file that's ready for editing using post-processing software.

It's likely that the needed copy or conversion equipment is already available at your workplace, quite possibly even at your home. For fast copying from hard-copy images, all you need is an average-quality digital scanner. A multipurpose computer printer with a scanner function will work just fine. Alternatively, you can make digital copies from prints or film using a digital single-lens-reflex camera (DSLR) with an appropriate lens, a good-quality "point-and-shoot" (fixed lens) digital camera, or even a cell phone that has a decent camera function. A cell phone camera of 2 or more megapixels resolution is quite adequate if it has autofocus capability and you use good lighting, perhaps along with a monopod/tripod or some other stabilizer or anchor. Numerous free or inexpensive cell phone apps are designed specifically for enhancing the quality of cell phone camera images.

Photographic post-processing costs can add up quickly in both silver-based or digital working environments. In either case, someone must pay for digital rescanning or digital camera copying, extra post-processing corrective work, reprinting time and costs, and labor time. But corrective changes will cost you far less in the new digital environment than in the past. The traditional chemical film and print process, bringing with it costs for photo lab supplies, corrective print-manipulation time, and the possible need for manual brush or pencil retouching, saw significantly higher skilled labor and production costs.

But even though added processing costs may be small, your internal overhead and labor are still going to inevitably result in the equivalent of another \$15–\$20 per image, and possibly more. Yes, you will reduce your time and expense from using silver-image photographic processing methods or outsourcing your digital post-processing work, but the added expense will still be there.

I estimate that in-house post-processing may cost you roughly \$15–\$20 per image, when you include overhead; but you can be sure that outsourcing your photo-editing work to a retouching professional will cost you considerably more than that. The obvious out-of-pocket outsourcing costs added to your internal overhead expenses will probably come to at least \$35, and possibly as much as \$50, per image. Thus, if you're dealing with more than just a few images, outsourced post-processing work can easily run into hundreds of dollars per project. Although automatic digital retouching is supposedly easier and cheaper than silver-based photo processing, the added third-party profit margin will still drive the prices above in-house work. If you're concerned about budgets (and who isn't?), doubling your expense simply makes no sense.

#### The Digital Photo Magic Alternative

I use the DPM alternative as a practical approach to digital photo retouching. There's no real downside: You can easily and confidently switch to it for high-quality post-processing of your images. As I've explained, DPM doesn't require highly skilled or excruciatingly laborious work; the leverage added by DPM automation puts this formerly expert technique well within the capability of the average person, if he or she is willing to take the time to employ it.

The DPM approach is simple and easy to understand. You don't need to buy expensive proprietary software. You don't need additional hardware. You simply assemble a toolkit of free or low-cost software tools, then mix and match the functions included in the programs to greatly leverage your editing power.

Here's a concise guide to applying DPM:

- 1. Choose a small, workable number of free or inexpensive, easy-to-use, and easy-to-learn photo-editing tools, making an effort to cover the range of post-processing tasks you're most likely to undertake.
- 2. Spend a short amount of time learning the nuts and bolts of the selected programs, experimenting and practicing on test images and learning the capabilities and shortcuts within the various applications.
- 3. As you work with the programs, identify the particular operations or functions that are the strong points of each. The programs that you find to be especially easy, fast, intuitive, and powerful for accomplishing specific tasks will earn a place in your post-processing toolbox.
- 4. Use the abovementioned "strong point" functions of your different software tools freely and interchangeably as you work on a single image to effectively handle the retouching and restoration tasks you think each tool is best suited to accomplishing.

After you've inventoried and identified the unique strong points of your chosen DPM applications, you'll find it easy to set up your own practical and efficient working routine. Let's say you decide you'll generally use Program A to quickly accomplish contrast and exposure touch-ups, whereas you may prefer Program B for the removal of spots, scratches, and blemishes, Program C for removing people or objects from a photograph and to "sharpen up" slightly unfocused images, and Program D for easy retouching of facial and skin blemishes.

Just as and when you select the most appropriate tool in your home workshop to do a certain job, you'll use the DPM tool that's best suited to a specific task. (You don't use a saw to drill a hole, right?)

You'll find that in addition to their ease of use, the use of the most appropriate DPM tools can significantly reduce the total working time for a particular image to a matter of minutes. The DPM approach takes less planning and operational time, and less conscious effort, than that required by complex post-processing applications such as Adobe Photoshop. DPM saves you a considerable investment in program learning time.

#### **Reasons for Post-Processing**

There's an endless list of problems that negatively affect the appearance of photo images. You'll often encounter such problems in image collections containing material produced by nonprofessional photographers—in donations or bequests to libraries or archives, for instance. These collections and individual images may have legitimate historical significance yet reach only the amateur snapshot level of quality. The images may be in dire need of post-processing before they can be viewed by the public—at least if one of your goals is to engender positive reviews and word-of-mouth publicity. Many of the types of problems you'll encounter may seem somewhat obvious, but here's my short list:

- Something about an image or graphic "just doesn't look quite right." It obviously needs a fix, something to tone up or spice up the image.
- Something needs correcting in the framing, composition, or orientation of the image. You need to do simple image post-processing, such as by cropping the image or flipping it left to right.

- Photographic quality issues are present in the image, including problems with exposure, contrast, focus, resolution, color shifts, white balance, and shutter speed errors.
- Physical defects are visible in the original image, such as dust spots, scratches, stains, tears, folds, and abrasions.
- Unsightly objects interfere with or distract from the primary subject of the image. Such unexpected or unwanted objects might include people, automobiles, buildings, machinery, tree branches, telephone wires, antennas or satellite dishes, and electrical towers.

These are examples of the cosmetic problems you may need to address before using photographic images for your intended illustrative or informational purpose. Although it's possible to make all these types of corrections using DPM, sometimes only retaking a photo will provide the desired result. Unfortunately, that's often not a practical option, and you may have to make an editorial decision to simply exclude a particular image. When feasible, DPM cosmetic post-processing is obviously preferable to eliminating an image, especially late in a project cycle, but even so, it's not a cure-all.

Keep in mind that post-processing may involve a policy matter in the particular organizational environment where you are using the image. A policy of "absolutely no manipulation of photographic images" is common in many publishing and news media operations. Such absolute prohibitions can be tempered; it still can be sensible to allow leeway for simple photographic cosmetic manipulation or repair of image damage so long as there's no deliberate distortion of reality. (I discuss such ethical and legal questions in some detail in the "Legal and Ethical Concerns" section of Chapter 1.)

#### **Typical Post-Processing Examples**

Use of appropriate digital image post-processing work occurs in many situations and environments:

- Personal, everyday life—post-processing applications in support of hobbies, personal or family historic photo collections, scrapbooks, memorials, and church, community, or similar displays
- Teaching and instruction—post-processing images for use at all levels of education and in professional and instructional training programs
- Publishing and broadcast media—post-processing for journalistic purposes, in newspaper and media libraries, to reinforce informational value, and to save time and money in institutional revenue-producing activities
- Marketing and promotional work for any organizations or small businesses—economical internal post-processing work for use in production of advertising, posters, handouts, displays, brochures, pamphlets, and other marketing materials
- Archival collection environments—post-processing in libraries, museums, private collections, corporations, organizations, and nonprofit and commercial archives

Legal questions about the acceptability of post-processed images can arise in all the above situations, ranging from issues of ownership and copyright to questions about the authenticity or legality of a particular image.

#### **Reality Checks before the DPM Decision**

Take time for reality checks before committing to any decision to use DPM on a broad scale in your organization. Yes, DPM is a quick, easy, and affordable path to editing and retouching images and illustrations for use in professional and personal projects, but as you probably learned early in life, there's no such thing as a free lunch. It will be prudent for you to carefully consider the factors relating to DPM and your particular situation before jumping in. These practical realities include considerations in areas such as quality-level demands, practicality of the technology, and user needs. We'll take a look at those concerns next.

#### **Quality Level**

Just how successfully can a beginner (you) be at improving photo images using DPM, in terms of quality and usability? To begin with, it's worth noting that DPM tools employ the same type of software technology found in the pioneering professional-level products. That's right—DPM software uses the same essential technology that began with Photoshop and GIMP. The main difference is that DPM apps have essentially added "automatic transmissions" to simplify and handle the intricate and often complicated control functions provided by the earlier products.

You may be aware that many of the operations used in the high-end products are widely supplemented by the use of third-party "plugins," modules designed to work within Photoshop and other commercial photo-editing programs. Plugins are created specifically to simplify and speed up the complicated photo-editing operations required with professional software tools. You can find scores of these plugin program modules, usually as freeware or inexpensive shareware.

As I write this, I've done a quick Boolean search:

"+photoshop +plugins +best"

That got me 43 results, including many pages titled things such as "Top PhotoShop Plugins," "10 Best PhotoShop Plugins," "25 Professional and Incredibly Powerful Photoshop Plugins," "30 Awesome and Exclusive Photoshop Filters"—and so on. You get the idea.

DPM applications provide the same kind of "automated plugin" improvements, but they include them in photo-editing applications of much less power. The DPM applications have simplified their overall application design by purposely concentrating on narrower areas of useful and streamlined functions. They don't even attempt to include the broad functional toolkit (and high pricing and learning curve) of the high-end software—and that's why they're so much easier to learn and use.

Products such as Beautune and CleanSkinFX concentrate on cosmetic facial and skin corrections. Others, including Inpaint and iResizer, specialize in seamless object and background removal and inserting images into composite illustrations. These programs generally provide a limited palette of general photo-editing functions. The software innovators have deliberately narrowed their program functionality down to only selected certain operations, but they have developed sophisticated "automatic pilot" versions of those operations.

DPM programmers can typically afford to release their products as freeware or inexpensive shareware because they are not underwriting the large staffing, production, and advertising budgets of the big guys. They don't charge \$150 or \$500 to compete with the market leaders. But they've definitely succeeded in developing their own market niche, providing powerful automated post-processing tools that simplify sophisticated photo-editing operations and significantly improve substandard images.

Of course, I can't guarantee that all your DPM-retouched images will be perfect. You'll need to start with images that have good potential for effective improvement, and you'll absolutely require tenacity, the benefits of experience, and some sound visual judgment. When you make those personal investments, your retouching and restoration prowess can reach a level approaching that achieved by experienced professionals working with high-end photo-editing tools.

In addition to reading *Digital Photo Magic*, be sure to take a look at the examples of post-processed images linked from the book's companion website at www.update4dpm.com. You may also want to examine some of the many examples, demos, and tutorials provided on the websites of the DPM products recommended in Chapter 5. Finally, to gain some objectivity, check out some of the specialized non-vendor websites focused on digital photo post-processing. (The DPM website provides links to many of these.) These special-interest online resources often include user forums or discussion areas that offer "how I did it" examples, along with software demos and Q&A's on a range of topics. You'll find an abundance of subjective opinions about the effectiveness of various software products. You'll also find numerous helpful demo videos—posted by both vendors and users on popular video sites such as YouTube and Vimeo.

For some comparison, look for coverage of the high-end products. Simply use your favorite search engine to find comparable practical information about products like Photoshop, GIMP, and PhotoImpact. As an example, when you search for the product name in Google, it's useful to use search queries such as the following:

+Photoshop +(best quality users tutorial review demos examples methods) +"Photo Impact" +(best quality users tutorial review demos examples methods)

Using the Boolean plus signs (+) and a parenthesized list of synonym terms (having no Boolean connectors in a list defaults to the OR connector) will narrow your search results to webpages emphasizing *the use and quality* of the *specified software*, rather than simply returning an unfocused list of free text hits, vendor pages, and download links. You'll be able to concentrate on checking webpages related to end-user discussions, non-vendor tutorials and demos, user evaluations, quality judgments, and product reviews.

By the way, these online explorations will also demonstrate the abundance of tutorial and learning information on the full range of post-processing software applications. You'll probably be surprised by the considerable time and learning curve commitments taken for granted by the tutorial offerings for packages such as Photoshop and GIMP. This type of online content certainly affected my own decision when deciding between learning Photoshop in 27 (or more) lessons and the abbreviated DPM learning commitments described at webpages such as the following:

- graphicssoft.about.com/u/ua/freesoftware/freephotoeditwin.htm *About.com* page of user-recommended photo-editing tools, with strong emphasis on ease of learning and easy program use.
- dottech.org/91806/windows-review-retouch-pilot/ Dottech.org review emphasis upon Retouch Pilot ease of use and its excellent "live" online tutorial demos, available instantly from the program window.
- www.theinpaint.com/tutorials.html *Inpaint* vendor site tutorial guide to the various software functions. Demonstrates the significant image corrections that can be made using a minimum number of keystrokes.

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I began my personal exploration of digital photo post-processing software by looking for an easier way. My searches quickly located the kinds of DPM product reports I've covered here. The material I found online encouraged me by demonstrating the relative ease of use of DPM products and the acceptable image quality I would be able to obtain by using them. I haven't been disappointed with my post-processing results in the three years since I began using DPM, and I don't think you will be disappointed with your results, either.

#### Practicality

As a reality check, it's important to recognize that DPM won't instantly transform you into a skilled image restoration artist capable of expert-level retouching work. You simply can't advance immediately to duplicating the hard-earned skills and high-quality output of experienced professional retouchers.

That said, neither will DPM stop you from doing excellent photo-retouching work with a minimal amount of practice. Consider that I created some of the before and after post-processing examples presented in the book after having used DPM software for just 3 months.

A well-developed visual sensibility and a creative aptitude are key components of the professional retoucher's skill set. But perhaps even more important is dedication to the hard work of learning and mastering a number of very demanding software applications and working processes. However, for a beginner, these new DPM tools will eliminate a great deal of the learning time and practical experience required in an earlier era. DPM software makes this possible by using post-processing technology horsepower to leverage your innate visual sensibility.

With a bit of practice, your retouching work should soon meet the minimum quality demands of your library, museum, school, or archival institution in the production of images for reports, publications, PowerPoint presentations, exhibits, and displays.

What I call the DPM "good enough" approach comes from what many management types refer to as the "Pareto Principle," or the "80:20 rule." This rule of thumb states that in most tasks or projects, 20% of the effort accomplishes about 80% of the desired results. The rule further concludes that striving to achieve that elusive remaining 20% of quality or results will wind up adding another 80% to the project's cost and effort. In other words, pursuing further steps in quality improvement leads to an increasing amount of effort in order to gain ever-decreasing results. Striving for perfection—going for that extra 20% or that last 5% of quality—may be an honorable goal, but it's going to cost you dearly in added time, effort, and expense.

I view DPM processing as a prime example of the 80:20 rule. Taking a pragmatic, results-based approach, when using DPM I recommend you observe the following guidelines:

- Decide at the beginning what's "good enough."
- · Identify the important stuff that really needs doing.
- Do that stuff well.

Many people sum up this commonsense outlook as follows: "Don't let the perfect get in the way of the good." It's a rule of thumb that I certainly recommend for most, if not all, of life's endeavors.

#### **User Requirements**

The level of photo retouching and restoration in which you engage should be based on customer or user needs, so it's important to consider and address these needs early on. At the outset of a project,



**Figures C,D.** "Don't let the perfect get in the way of the good." Here's an example of what you can accomplish in 10 minutes or less using simple photoediting tools. (Restored family photo of Jessie Anna Gordon, at left; St Joseph, Missouri, 1898.)

begin by identifying and clarifying output quality issues. A prudent and inclusive planning process will address the concerns of all levels and types of customers involved and will subsequently be discussed with all appropriate managers and decision-makers.

There's a wide range of user need levels: restoration of cherished personal family images; reproduction of rare historic illustrations; restoration of important cultural or traditional images; depiction of the history or development of particular practices or processes; promotion and marketing of library, museum, or archival collections and services; and, probably most demanding, the production of high-quality images for publication or exhibition purposes.

Such varied requirements have to be located or defined on a sliding scale. Are you working to produce a good-quality photographic print, a fine-quality 16×20 photograph for display, a displayed or projected PowerPoint image, a webpage image, or a print or digital image for exporting into a printing or publishing process? Each of these possible uses will involve markedly different quality concerns and end product specifications.

For example, 300 dpi generally suffices for producing a quality glossy print of 8×10 or smaller size, whereas 72 dpi is considered satisfactory for electronic image display, this being the current resolution limit of a computer display. The size requirement for a print is usually a major concern. A high-quality 11×14 print requires 600 dpi; a 16×20 print calls for 600–1,200 dpi.

The variability of this sliding scale brings us right back to the "perfect versus good" guideline I mentioned earlier. Remember: First, you have to get everyone involved to agree on "what's good enough." Then you agree on what things are "the important stuff that really needs doing." Then it's time for the execution or production phase, during which you "do that stuff well."

It's a shared responsibility. Your end users must be clear about what they need. And you, the "in-house post-processing expert," must also be clear about what you honestly think you can accomplish. Reality must come into the negotiation; it's pointless to work to meet unrealistic objectives—or to put lots of work effort into a hopeless task. That said, you can see it's mostly a matter of getting everyone on the same page.

After that, it's going to be much easier to do the right stuff and to do it well.

## DPM—What's In It for Libraries, Archives, Museums, and Schools

Why should busy working professionals in libraries, archives, museums, and educational institutions consider adding editing, or "post-processing," of photographic images to their workloads? There's only so much time in the workday, so why even *think* about increasing your duties and responsibilities with additional work?

The answer is simple. Digital Photo Magic (DPM) is easy to learn and use, a low-cost approach to digital image retouching and restoration that can pay off big in improving the quality of the images your institution uses, shares, and archives. For almost any presentation or exhibit, using DPM is like putting icing on the cake. You'll gain an extra special edge of presentation quality that can instantly enhance your output and upgrade a surprising variety of projects.

#### **DPM Benefits Summary**

DPM is a cheap and easy, yet effective and productive, approach to retouching and restoring digital photo images. It improves the appearance, usability, and visual impact of photographic and other images used in your informational and educational work. With just a bit of practice, you will find that DPM is among the simplest, fastest, and most practical approaches for improving the quality of your institution's photographic images.

A number of factors make DPM particularly useful in the cultural and teaching environments which I emphasize in this book. I'll summarize those factors here and follow with detailed analysis and comments in the section on expanded DPM analysis.

- *Capital and operational economies*—A large startup investment in computer and electronic hardware will probably not be necessary. Today's average institutional or office working environment should constitute an adequate working setup. DPM operations should thus add a little or no capital or operating expense to your budget. DPM *will* add a little staff labor expense, but this should be relatively minor unless—until—your organization experiences a robust and growing demand for the new photographic services. Many institutions would find that as a good problem to have.
- *Low learning curve*—DPM gets an A+ in this area, avoiding the often expensive labor and time commitment required to learn complex professional software products such as Adobe Photoshop or GIMP. Selecting easy-to-use DPM software tools simply eliminates "rocket science" user requirements. Aimed mainly at the interested hobbyist market, free and inexpensive DPM technology can and does produce high-quality photo images.
- *Personal skills and productivity*—Photo-editing expertise is a valued and relatively uncommon skill that can help employees expand the breadth and quality of their job performance and increase their productivity. Perhaps surprisingly, any competent computer user can quickly learn to use DPM. If you have mastered spreadsheet or word processing applications, you should have little trouble working with DPM tools.

- *Pinpoint precision image control*—I refer not to the digital camera's fine-focusing capability here, but rather to DPM's ability to produce precisely top-quality informational photo images needed by a user or organization. With DPM, it becomes easy to make cosmetic improvements, correct imperfections or damage, and markedly improve poor lighting or contrast in any photo image. DPM provides the capability to change an image so that you get just what you need.
- *Copyright area clarity*—Yes, there are legal constraints over the use and manipulation of photographs, and your institution needs to understand and respect the copyright rules and restrictions governing the images you will be using. Find these regulations, then produce and follow clear guidelines and decision aids for your staff that will provide easy and reliable warning of possible violations. Numerous publications and websites can aid in this area; some good resources are identified and listed in the "Expanded DPM Analysis" section of this chapter, under the heading "Copyright and Legal Area Clarity." After identifying potential copyright liability, seek guidance and legal advice as necessary to avoid or resolve problems.
- *Copyright licensing economies*—Significant usage fees are often not required for libraries, archives, museums, and educational institutions. Educational, public, and nonprofit agencies often have a valid legal defense under the fair use exceptions delineated in U.S. copyright law; this means that in general, such institutions are often not burdened by the licensing fees that normally apply to for-profit corporations. To maximize these savings, establish and follow a usage policy designed specifically to reduce copyright expenditures.
- *Fee waivers or discounts*—Many copyright owners will either waive or greatly discount their licensing fees for educational or nonprofit use of an image or collection, usually in response to a request by the user that includes an assurance of proper source credit.
- *Public domain materials*—Internet access to the enormous resources of graphic image materials in the public domain will result in no licensing costs for internal users, external users, or departments. (Detailed coverage of the public domain topic begins on page 15.)
- *External users or external units*—If we are providing photographic materials for the use of another department of our agency, or for external users of our services, then our own operation or unit is not responsible for any copyright licensing costs that may be incurred.
- *Legal and ethical concerns*—Prudent professional and organizational policy guidance is important in the broad area of ethical practice. Major concerns in this area include legal exposure to charges of fraudulent, deceptive, or malicious intent in altering an image; need for model or other personal releases; invasion of privacy; copyright infringement not defensible under fair use provisions; straying past accepted standards of professional practice; and copyright or legal violations. Many potential problems can be identified and addressed ahead of time by consulting authoritative government and professional publications and policy statements. Although not all questions that may arise are clearly defined or settled, it is advisable for organizations to have an institutional guide or checklist in place to cover the most common issues. Such a guide will be helpful to both staff and end users, and although it may not offer definitive answers to complex legal questions, it should provide sensible advice in regard to help identify potentially sensitive situations.

#### **Expanded DPM Analysis**

In this section, I'll provide expanded analysis and commentary on the topics outlined in the preceding section.

#### **Capital and Operational Economies**

It's unlikely that you'll incur any significant expense starting up your DPM operation. You probably already have the necessary computer, digital camera, scanner, and printing equipment in your office or elsewhere in your organization, and DPM software is inexpensive—even free. Your potential DPM staff "expert" practitioner already likely has the required workstation equipment, meaning that he or she can get right to work using DPM technology. An alternative approach is using shared or networked access to hardware or arranging simple physical access at some nearby location in the organization.

You probably won't incur any significant supply expenses, either—not in today's post-darkroom photo environment. Photographic-quality print stock and high-quality black-and-white and color inks are just about your only incremental expenses. *Consumer Reports*'"Printer Buying Guide" (Consumer Reports, 2013) reports that for most printers, "printing a 4×6 color photo costs about 25 cents, and the cost of printing a color 8×10 photo ranges from \$1 to \$2 or more, including ink and paper." That's bargain pricing for a good-quality color photo print. So if you make high-quality photographic prints yourself, in your office, it's certainly won't be a budget buster. But even if you don't have workplace access to a good color printer, it's still not a large expense item if you opt to use 8×10 color photo prints costing \$3–\$4 at your local pharmacy, office supply store, or big-box retailer.

Of course, most library, museum, archival, and educational projects won't require the production of large quantities of quality photo prints. (And if patrons or end users require prints, in many cases the cost can simply be passed directly to them.) Many of your DPM photo images will be regularly handled in electronic format, helping keep costs low. It's common now for direct digital file export to be preferred when providing images for publications or websites. Furthermore, *Consumer Reports* points out that a medium-resolution quality color print on plain paper is suitable for a great deal of production work: In other words, use the most affordable printing options whenever possible, and save the "pretty printing" for when it's actually needed—for example, for displays and exhibits.

One potential cost I'll mention here is an optional investment in a color ink jet printer capable of producing oversize photo prints—that is, prints larger than 8×10. Such printers can be a bit pricey, so you can expect to pay a premium for the ability to output good 11×14 or 16×20 prints. However, in most institutional operations the need for producing outsize prints may be infrequent. You'll have to make the decision depending on your particular needs.

You can always outsource the occasional enlargement, of course. Commercial labs can produce an exhibition-quality 11×14 for \$5–\$10, or a 16×20 for \$15–\$20. And don't forget about the bargain photo service outlets, such as Costco or Walmart. They offer 12×12, 11×14, and 12×18 enlargements for \$3! I've personally not been unhappy with the quality of these enlargements, although I have occasionally requested (at no cost) second tries of prints to get a more pleasing version. Although we're certainly not talking about archival quality here, you may often be satisfied with bargain prints. At those kinds of prices, why not give them a try?

#### **Copyright Licensing Economies**

When thinking about how to reduce your institution's copyright licensing expenses, the first thing that may come to your mind is using more images that are royalty-free. Make this a routine approach

by taking full advantage of Google Images, which allows you to search for and instantly find photographs on practically any subject. While writing this, for example, I searched Google Images for a photo of a vintage 1946 Ercoupe private airplane, and hundreds of suitable images almost instantly appeared. A single click on a promising thumbnail immediately brought up an enlarged view, along with a bit of detail about the image—including a "Visit Page" link directing me to the original publication image.

All you need to do is follow the link and do a bit of work to contact the source. (Happily, photos are increasingly being annotated with handy email or telephone contact information.) Then ask whether you can use the photo, explaining (if applicable) that it's for nonprofit use, assuring the copyright owner of a prominent source credit or copyright notice. In my experience, it's usually quite easy to request and receive permission at no cost, especially when you are making your request of a private individual, community organization, or any nonprofit or for-profit firm that welcomes the source notice publicity opportunity.

Best of all, at the very beginning of your search, the Google Images advanced search function lets you specify the "usage rights status" of displayed images. Among the four, standard categories are "labeled for reuse," and "labeled for reuse with modification." This will aid your searches.

Other free or inexpensive image sources include local or national newspapers, corporate PR departments, and governmental agencies at all levels, especially legislative offices (always especially eager for public credit—and they have the leverage to get government photos for you, and very quickly). Even though some of these sources are not nonprofits, they all have a shared thirst for publicity and are often amenable to granting such requests to nonprofits. If you happen to ask a corporate source and your use falls within legitimate nonprofit guidelines, you might even point out that they can turn the waived licensing fee into a tax deduction. (Imagine that—a corporation can take a tax deduction for *not* doing something!)

As another cost control consideration, in our new digital image environment, you will rarely, if ever, need to request or pay a provider for a hardcopy print or photo negative, as was once customary. Now all you need is a digital format image file attached to an email message or placed on a cloud server. Free permission plus instant gratification—what more can you ask?

Significant operational economy is possible by a consistent routine of doing "free image mining" of online archives, other Internet sources, and appropriate local collections with the goal of locating useful royalty-free and public domain image resources. When you prepare formal policies and document your procedures, stress routine use of this "free image mining" approach. You want to make this essentially automatic in your operation—it pays off handsomely.

A general Google search for royalty-free images returns some 35 million results. Overwhelming, yes—but the Google ranking algorithm will show you instant evidence of the huge choice of free and commercial royalty-free image sources. Many of the commercial photo services and stock photo agencies actually offer a limited introductory number of freebie or bargain-priced images as loss leaders—handy, since you're probably not actually trying to obtain large numbers of photos. These royalty-free photo services make their money by charging for subscriptions or downloading of image files and charge no royalty fee for image use or publication. There are seemingly endless opportunities to find just what you need using these services. Keep in mind that many professional sites, museums, historical societies, private collectors, county records archives, and the like offer royalty-free photo collections:

• [Commercial] 123RF: Free Royalty Free Photos, Pictures, Images and Stock Photography (www.123rf.com/freeimages.php)

- [Commercial] ClipPix ETC: Educational Photos for Students and Teachers (etc.usf.edu/clippix/)
- [Commercial] Fotosearch.com: Stock Photography (www.fotosearch.com)
- Free Technology for Teachers: 9 Places to Find Creative Commons and Public Domain Images (www.freetech4teachers.com/2011/06/9-places-to-find-creative-commons.html# .UpVCF-Kd6fU)
- Hennepin County Library—The Minneapolis Photo Collection (www.hclib.org/pub/ search/MplsPhotos/)
- Library of Congress: Prints and Photographs Online Catalog (www.loc.gov/pictures/) An enormous collection, with royalty and copyright restrictions always noted.
- Oregon State Library: Historic Photo Online Archive (photos.lib.state.or.us/exhibit2/ vextitle2.htm)
- Salem Public Library: Historic Images of Oregon (photos.salemhistory.net/)
- Teacher Tap: Visual Resources: Photos and Clip Art (eduscapes.com/tap/topic20.htm)

#### **Copyright and Legal Area Clarity**

It should go without saying that you must always resolve copyright and related issues *before* using anyone else's image. As a legal and administrative matter, rather than a photo-editing concern, this particular activity is beyond the scope of Digital Photo Magic, but I will offer a few recommendations for your consideration. I am not a lawyer and none of my comments or suggestions should be mistaken for legal advice.

The Internet makes it easy to find simple, clear, and understandable copyright law information. The U.S. Copyright Office (www.copyright.gov) is the primary and most obvious source. Its website offers accurate and current information about copyright law and easy access to downloadable forms and documents.

Many other informative websites can help on this topic. A simple Google search for "photograph copyright" returns dozens of links to reliable sources. (And also, no doubt, to questionable information sources.) If you are in the position of reproducing images originating from outside sources, please remember that you must perform due diligence in evaluating the copyright status of those images. Several handy online information sources at the time of this writing include the following:

- *Photography, Copyright, and the Law* (blog.kenkaminesky.com/photography -copyright-and-the-law) A brief, yet authoritative, overview summary of photograph and image copyright law. This concise blog post is based on an interview with photographer and attorney Carolyn E. Wright, a copyright specialist who literally wrote the book on photography law, Photographer's Legal Guide (ISBN 978-0-9790353-0-2 / 0-9790353-0-9, also available for Kindle).
- 11 Free Online Copyright Tools for Photographers and Artists (www.plagiarismtoday .com/2010/06/17/11-free-copyright-tools-for-photographers-and-artists) Author Jonathan Bailey covers 11 free online tools to help you through the maze of photography copyright law. The page includes items on the copyright statute, on embedding ownership or watermarks to identify your own images, and on doing "reverse image search" online

(using an image recognition search engine such as Google to find a specific image, helping you determine copyright ownership)—and even a guide for stopping abuse of your own materials or restorations (cease-and-desist notices, infringement action guides). This site is a valuable resource for people involved with publishing or distributing photographic images in any format—whether hard copy or online.

• *Teaching with Digital Images* (www.iste.org/docs/excerpts/DIGIMA-excerpt.pdf) This is an online excerpt from Chapter 4 of *Teaching with Digital Images*, a book published in 2005 by ISTE (International Society for Technology in Education) covering copyright information and specifically aimed at teachers and students.

Google and other online search engines are well suited to locating specific or detailed copyright information. These search engines also enable you to focus your search on a narrow subtopic by simply adding additional topical terms to your query. Ensure that your query includes terms specific to your topic and your copyright and usage questions and concerns, including—for example— originating copyright owner, company, and activity. Effective Google queries include "copyright reprinting," "copyright permission contracts," "federal agency copyright," "grant research copyright," "state government publication copyright," and so forth. If you search for these and similar phrases, I think you'll be impressed by the results.

The *Digital Photo Magic* companion website (www.update4dpm.com) provides a categorized, hyperlinked listing of useful online resources, including a copyright category that will be of interest to professionals actively working in this area. Again, this is no substitute for legal advice.

#### Low Learning Curve

Adobe Photoshop is widely considered the premier photo-editing application. There are a few challengers to the graphic detail and control made possible by this complex and sophisticated program suite. (If you ever do decide to venture into this industrial-strength professional level of software, you might do well to consider the GIMP freeware package, a respected alternative to the very expensive Photoshop.)

Photoshop is routinely used across a spectrum of disciplines and specialties requiring precise control over graphic images of all types. Specialist users include the production departments of publishing companies, medical practitioners and illustrators, forensic investigators, graphic artists and designers, manufacturing designers and CAD (computer-aided design) specialists, advertising illustrators, website designers, architects, archaeologists, and essentially anyone else working professionally with visual or graphic images (Adobe, 2013).

Photoshop is an incredibly powerful digital image editor, partly because of the precise level of control it gives users. In fact, the expression "photoshopped" has become a popular English language colloquialism, used to mean that a photo or graphic image has been cosmetically altered, often also implying that the modification has far exceeded reality.

Photoshop makes this unlimited retouching or post-processing ability possible with its combination of exquisite control over visual images and effects, as well as the powerful automated image processing it uses to perform seemingly impossible photo image manipulations. Some of these functions seemingly provide the operator the ability to think and command: "Take that stuff that sort of looks like that and change it over to looking like this, and maybe even better, really." In other words, the digital retouching artist can simply tell Photoshop, "Do what I mean"—and the software does it.

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The downside of Photoshop's power and complexity is that it's an exhaustively complicated program to learn. Despite all the built-in automation, it makes so many operations and techniques possible that becoming a skilled Photoshop user takes massive effort. Indeed, Photoshop has spawned an entire industry of freeware and commercial support tools, including guidebooks, tutorials, videos, seminars, credit and noncredit courses, and user groups, as well as a legion of third-party developers of plug-ins or support software modules, to further extend the software's power.

Photoshop is certainly not something you can pick up on the fly by just starting to use it and depending upon intuition and good online help to get you by. This level of software requires a serious investment of time, study, experience, and commitment.

I do fully respect and appreciate the power and control offered by Photoshop and GIMP. There are many reasons for the excellent reputations these photo-editing tools enjoy. But I think it's more productive for you to cut your post-processing teeth on some of the simpler DPM-recommended software products. You'll quickly and easily learn a lot about post-processing technology by using DPM tools for introductory photo-editing. You'll gain experience and confidence in the various techniques used in image editing, and this basic or introductory knowledge will make it much easier for you to learn one of the high-end photo-editing tools down the road—if that becomes necessary. It's a little like learning about sports car handling on a Miata or an MGB before graduating to your dream Ferrari or Maserati.

#### **DPM Software Alternatives**

I advise that you begin with DPM software programmed in an easy-to-use yet powerful style and with a simple user interface. The simplified or "baby steps" computer tools make it easy to learn the basics of photo-editing. Such an approach provides intuitive controls combined with the power of highly automated functions. This approach delivers the maximum photo-editing leverage to help you achieve the desired results.

PhotoScape, for example (see Figure 1.1), provides many of the functions that appear in programs such as PhotoShop and GIMP. In DPM-style applications such as PhotoScape, these functions are clear and obvious to the user. The operations are easily accessible through well-designed menu structures. The program routinely and automatically pops up hints and tips, providing pertinent and essential coaching and user help. These popup guides typically appear immediately after selection of a particular function, keeping you on track by giving you information on what the function or operation does, the shortcut function or command keys for using it, how to change the degree or strength of what it is you're about to do, and even how to easily undo what you've done (oops!).

For example, even though PhotoScape contains the standard Ctrl+Key shortcuts and undo/redo buttons that help you recover from mistakes, it's also comforting to see hints and have instant access to on-the-fly tutorials. These tutorials offer great support for those just learning the craft of photo-editing and the program functions, and they also serve as useful refreshers even for more experienced users. PhotoScape provides you with the photo-editing equivalent of an automatic transmission as opposed to the more effective, but harder to learn, manual transmission you get with Photoshop.

Retouch Pilot is another application whose user interface is designed in the same spirit. At any time, you can simply save wherever you may be in your work and then quickly call up onboard multimedia demovideos of any of the major functions. This is a great help in your moments of—"Oh, yeah, I haven't done <operation X> for a while . . . . Hmm, just how was it that I'm supposed to do that?"



**Figure 1.1** PhotoScape's clear and helpful user interface starts with an easy-to-understand tabbed menu at the bottom of the work screen. All menu and command buttons are grouped together at the bottom of the screen. Here, the user has already selected the Tools menu from the Tab headings, then the Effect Brush submenu, and finally the Paint function from a popup list. Brief and helpful usage notes are automatically displayed just below the center of the photo image.

iResizer and Inpaint are two additional specialized photo-editing applications offering similar user help interfaces. Both programs simplify and automate complex image editing operations. For example, iResizer can automatically alter the spaces and ratios between user-designated objects within a photo image. It can completely remove objects or people from the image, seamlessly replacing missing background detail. iResizer makes it easy to change a photo in a rectangular land-scape format to a square format image, automatically moving image contents to fit correctly. iResizer can also remove people, buildings, trees, telephones, roadways, and more from an image, seamlessly replacing or filling in the missing background detail.

Inpaint provides more of these same kinds of capabilities. For a preview of its automated functions, check out "Photo Restoration and Improvement Made Easy with Inpaint," at www.theinpaint. com/tutorials.html. And keep in mind that both iResizer and Inpaint offer the same kind of helpful instant tutorial demonstration I described earlier for PhotoScape. It's like having your own coach, mentor, or retouching guru available 24/7, something that's immensely helpful when you're in the midst of some operation and suddenly realize you've lost the thread of what you're doing. Many other DPM applications also offer neophytes instantly accessible tutorial guides or even seamless online connection to full help advice and tutorials.

As an example of how effective these tutorials can be, consider my own recent experience using iResizer to produce a photo image for the cover of my wife's and my 30th wedding anniversary

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souvenir scrapbook. I needed to move the two of us closer together (in the photo!) to fit the image into a defined square area. The original landscape image proportions unfortunately included a good deal of space between Sandra and me, and when I tried reducing the photo to clearly show both of us, it resulted in white bands across the top and bottom of the square space. After reviewing the online tutorial, I was able to make the necessary fix in fewer than 4 minutes. The end result was perfect. If you go back to Figure 1.1, you'll see that the top two small images in the thumbnail display on the left side of the photo are the closer-together square versions I made using iResizer.

Within my personal collection of DPM software tools, the PhotoScape freeware is probably my most-used "serious" photo-editing application. Even so, it's only one of a number of excellent DPM software tools we will examine more closely in Chapters 5 and 6.

#### **Personal Skills and Productivity**

DPM is a low-investment/high-return approach to expanding the skills and increasing the productivity of a broad range of staff members in your operation. Photographs add value to many types of projects and activities, and you'll quickly find the application of photo retouching and restoration skills far wider than you'd first imagined.

From a human resources point of view, these are terrific staff development skills to teach and learn within an organization. Generally speaking, staff members will find using DPM enjoyable, creative, and satisfying. DPM is easy to learn and produces quick, useful, and highly visible results. Many employees will find DPM proficiency rewarding, not least because of positive reactions from customers and colleagues. In addition, they'll probably find DPM useful in their personal life, including in family, hobby, and community activities—and more. DPM can also represent an external business opportunity for some individuals in light of the growing demand for photo retouching and restoration services.

Using DPM successfully requires basic computer expertise, good eye-hand coordination, and, ideally, a visual or creative bent. Anyone who has a professional certification or graduate degree can benefit from learning DPM, a skill that will present them with an opportunity to add or expand photographic and visual graphics expertise—a useful augmentation to such an employee's expert knowledge. It's also appropriate to assign DPM work to individuals in technical or clerical positions, who may welcome the opportunity to learn new, highly valued computer skills and competencies.

There will be cases in which DPM cross-training or assignment to multiple staff members may also be appropriate. Staff can benefit from working collaboratively with colleagues, both during the formal or informal group-learning process and later, as a shared work activity. Such cross-training adds desirable skills redundancy within an organization, and the collaborative working group approach is an effective means of boosting morale, improving job satisfaction, and increasing productivity.

#### Personal Skills and Productivity—DPM in Libraries

I've been an amateur photographer since my high school days. But I really became interested in digital photo editing after retiring from nearly 35 years working in libraries, where I spent more than half my career managing editorial library operations for large newspapers. I had the good fortune to actually take part in the transition from the old-time "morgue" clipping file operations to computer-ized full-text editorial content databases.

But I was also fascinated by the archives-style operations involved in building and maintaining the enormous editorial department image collections. These housed literally millions of photographic prints, transparencies, and photographic negatives. Both as an advanced amateur

photographer and a professional librarian responsible for sizable collections of image resources, I became quite interested in preserving, improving, and restoring photographic images.

In recent years, we've seen rapid evolution of digital photo technology. My previous experience with the old manual retouching methods showed me that the new digital photo-editing tools allowed virtually the same kind of creative control over photo prints and images while having remarkably smaller requirements in terms of time, labor, and expense.

The extensive image collections held in libraries have enormous historical and cultural value. These collections are not meant simply as an exercise in hoarding: They are intended to be seen, appreciated, and used. Improvements in accessibility and usefulness of images can greatly benefit society while also enhancing the stature of the libraries that so diligently curate and maintain such collections.

As part of the background research for *Digital Photo Magic*, I contacted photo collection operations at numerous libraries, intending to identify and document current practices with respect to restoring and retouching digital images. I interviewed photo collection managers at several academic, state, and public library institutions but was surprised to find that no program actively offered digital retouching or restoration services to internal or external users. Here's what I discovered:

- 1. A few of the libraries responded that individual librarians might occasionally offer limited image correction or cosmetic service. This generally depended completely upon the specific librarian's familiarity with Photoshop or similar tools. There appeared to be no active educational or in-service training efforts in this area. This made for uneven customer service, at best, in promoting the use of photo and other image resources.
- 2. Many of the libraries partnered with a selected commercial photography service as a means of offering digital photo services to patrons, with any commercial fees paid by the patrons. An example is the Salem (OR) Public Library Historical Photo Collection, which partners with PhotoVision, a local commercial photography service. I spoke with Steven Wood of PhotoVision, who told me that the firm rarely does any post-processing work for library patrons. Their normal minimum service level (\$10) covers routine image cropping, contrast adjustment, lighting/exposure adjustment, and preparation of a print or digital image copy. Not terribly expensive—but it's really just about the same level of service that you can expect in the photo department at the drugstore or a large shopping center retailer. More sophisticated image post-processing work is done on a quote-only basis and generally runs \$25–\$50. (At press time the Salem Public Library printing service was described as "not currently available;" hopefully they are working to restore it.)
- 3. Many library photo collection departments commented that they'd seen a significant drop in requests for photo prints. Users now instead prefer digital photo files, and they specifically request them. Some of these libraries also depend on the personal talents of the particular librarian on duty, who—we hope—can scan a photographic print or printed image to produce a digital photo image. Most users are satisfied with scanned JPEG files, though TIFF files are actually a preferable starting point for use in most reproduction processes.
- 4. Most of the libraries have no professional staff member who has significant knowledge of digital photographic technology. In fact, several of the libraries depend on volunteers to manage the photo collection. At one of the libraries, a volunteer was the person who actually organized the photo collection and storage system.

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Only within the last 20 years has digital photo technology become the driving factor in the photographic industry. This has occurred in both camera hardware and in photo-editing applications. As I assert frequently in this book, early generations of photo-editing software have been characterized by complicated and demanding high-end programs such as Photoshop and GIMP. Fortunately, we now have a range of easy-to-use DPM alternatives available.

#### **Critical Observations about Library Photo Collections**

My informal survey of the current state of library practice in the management of photo collections yielded disappointing results and suggests a significant need for improvement. I offer here a list of critical observations that I believe merit consideration by library managers, graduate library school programs, and responsible individual professional librarians.

The *casual and disorganized approach to the management of library photo collections* is evidence of deficiencies in library education and training. This profession is, after all, devoted to the storage and retrieval of information. Visual images certainly are part of that spectrum.

Improvement and standardization is urgently needed for photo collection management systems, collection organization, retrieval technology, and end user collection access software. There are established systems and protocols available throughout the country for just this. Good examples may be found and studied at newspapers and other media organizations, commercial photography sites, wire services, and local photo processing operations. It is also relatively simple—and free—to use Google to index the online image content of a particular collection, offering easy user access, descriptive text and data field searching, and even image recognition searching at no cost.

Library managers and educators must require higher skill and training levels for professionals working in the photographic collections area. By way of contrast, we don't employ librarians who are not professionally up to snuff in specialized reference fields, online information technology, or the use of print and online indexes.

*Photo collection library services need to catch up with digital photo technology.* The current headin-the-sand approach feels equivalent to retaining daguerreotype or collodion-glass-plate negative collection management practices in a silver-print photo environment.

Libraries need to plan and standardize fee-based photo and image services across the board. Many libraries currently "partner" with commercial photographic services for production of user materials from their photo collections. This basically sets up a third-party monopoly with arbitrary pricing for using library collection materials. It also turns over income and potential profit to the favored outsourcing service rather than letting the library generate income in support of its collections.

*Cost-recovery pricing of material from intellectual property collections needs re-examination.* We don't charge for circulating books (except rental collections). Another conundrum: Current practice often involves charging the same price for both photographic prints and digital photo files. There's no rationale for this. In our current practice, this means a library can charge \$10 for scanning a photo print as opposed to 10¢ for a photocopy of a printed page—or nothing at all for an Internet file or online document copied from a library PC to a user-owned flash drive or CDR/W disc. I believe that's simply not justifiable.

Libraries need to study the pricing rationale for user amenities and for planning infrastructure equipment and facilities. We currently provide users with free broadband Internet access, inexpensive copy machines, free pencil sharpeners, and free remote access to library catalogs and licensed databases. Should we not, then, also provide photo collection users with free or very inexpensive multifunction printers that can scan and print black-and-white or color photographs? We should be

able to say, "Oh, if you need a color print copy of <photo X>, you can print a color 8×10 glossy on this printer for 25¢ a print."

Libraries need to further investigate storage and preservation practices for digital photo image collections. We need to arrive at archival best practices that maintain order and accessibility, as well as to ensure that our collections remain viable as image formats evolve and obsolesce over time. We need to develop methodologies for digital format storage, for digital backup security, and for migration of obsolete image formats to current established formats. We must do this to respond to evolving image representation formats, just as we had to develop practices to deal with handling stereoscopic images, tintypes and *daguerreotypes*, nitrate films, and obsolete videotape formats. We need answers to questions as simple as the following:

- Is the photocopying illumination used in scanning silver or digital photo prints destructive to those images?
- Should copying of prints be restricted to digital camera copying using only ambient lighting?
- What are the current archival qualities of digital photo prints?
- Is pigment dye superior to inkjet ink for production of digital color prints?

And there are many more such questions.

As I wrote earlier in this section, my small survey of some sizable institutional image collections greatly surprised me. I have explained that I found practices to be lacking in this area. This somewhat casual approach to photo collection is not surprising in light of the rapid evolution of digital image technology. I anticipate that library and archives professionals will thoughtfully begin to develop more standardized and effective practices in this specialized area.

As I explain in the "Low Learning Curve" section of this chapter, DPM tools enable even technologically unsophisticated professional and technical/clerical library staff to provide high-quality photo and image services to patrons and internal customers. DPM helps knowledge professionals both guide their clients to identifying and locating desired image resources and provide timely delivery of digital files and prints. Copyright licensing matters aside, I believe that the image resources of a publicly supported library should be available to users at reasonable cost, and DPM supports that goal.

#### Personal Skills and Productivity—DPM in Education

DPM operations can certainly contribute to the adoption and expansion of new technology in modern educational institution operations. A superb example of digital camera and digital image applications is found, for example, at the website of the Forsyth County Schools, in Georgia (www .forsyth.kl2.ga.us/page/1543).

The Forsyth County public school system has totally committed to expanded integration of technology to enhance and improve educational outcomes. It has published its intent to lead in the adoption of "a system-wide standard of providing . . . a system-wide standard of providing a 21st century learning environment in every classroom[,] which includes an interactive whiteboard, a ceiling mounted projector, teacher notebook computer, sound system, and connections to the closed-circuit broadcast system, the instructional technology department works with the ITS and Media Specialist to provide professional learning and model best practices in the use of these

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technologies. In addition, student response systems in a ratio of one system per six classrooms are available to increase the formative assessment tools available for teachers." (www.forsyth.k12. ga.us/page/1526)

Forsyth County's emphasis includes providing a digital camera for every teacher, along with solid instructional technology and technical support. An active instructional program helps teachers ensure competence in the productive use of their technological infrastructure. Teachers participate in ongoing professional development to experiment, initiate, and create new models of teaching and learning for dynamic and changing curricula. Instructional technology specialists are also assigned to each school, working directly with teachers to help model teaching and learning strategies for technology integration.

The Forsyth.com website previously contained a teacher-directed page (now removed) describing numerous digital photo classroom applications. This page was much linked to by the national education community and was entitled, "Why I Should Use a Camera in the Classroom." It contained numerous practical examples of the Forsyth system's approach to technology support for teachers.

"How can I use a document camera in my classroom?" (www.edtechnetwork.com/document\_ cameras.html) includes a similar list of recommendations from the Educational Technology Network. The digital photo and video suggestion list section for preschool and primary-level teachers includes items such as show-and-tell, science experiments, photo enlargements of small items to better show detail, documentation of mathematical operation sequences, demonstration of letter formation, display of introductory images to call attention to scheduled topics, teacher modeling of filling out worksheets, recording or capturing classroom or document images for future use, documenting classroom activities for display to parents or beginning teachers, and capturing images for use in PowerPoint or Windows Movie Maker presentations, among many other uses.

Using the Forsyth district model of implementation of digital photos, and wide instructional adoption and support from professional sites such as edtechnetwork.com, it's evident that DPM technology can supplement the generous use of photo images in all such activities. Simple DPM image improvement tools will ensure that the images are not amateurish or mediocre, also reducing time, expense, and necessity for restoration or re-creation of desired photographic images.

DPM processing should be valued within the educational professional mainstream, as demonstrated by increased attention to the use of photo image teaching materials by professional groups and educators. The use of digital photos and other visual images in the wide range of communications, exhibition, display, instructional, informational, and publications applications in the teaching field has received wide attention within the community. By way of illustration, searching the website of the International Society for Technology in Education, www.iste.org, for "digital camera" produces more than 6,000 results.

#### **DPM Online Resources for Professionals**

Beyond primary and secondary education, training professionals and a variety of organizations and groups are actively developing educational offerings and curricula for learning in the visual image and photo-editing areas. A collection of links to online resources for library, archival, museum, and teaching professionals is available on the DPM companion website.

#### **Pinpoint Precision Image Production**

This brief explanatory note clarifies my terminology in the earlier summary list at the beginning of the chapter. I speak specifically of DPM's capability to improve a single photograph to best fit a user's

*specific need or purpose*. A DPM operator or technician works with the intent of improving or restoring a photo, focusing on producing precisely the type of image the planned use calls for. DPM tools provide easy fine-tuning capability to produce just what you want and need when incorporating photographic images in a given project. In addition to the basic photographic operations such as cropping, exposure, and contrast control, DPM adds the power to make quality improvements or corrective modifications to existing images. Whatever the image origin—whether it's a newly produced digital photograph, a file image, an archival or historic photo, or even an image or illustration scanned from some other source—DPM enables you to quickly alter or tailor the image to suit your needs.

#### **Legal and Ethical Concerns**

Most information and education professionals are fully aware of the value and benefits of using photographs and other visual images in their work; these are widely documented both generally and within our respective professional areas of literature. It is, however, inevitable that the question of whether and how augmented or altered images should be used will arise, and we need to remain sensitive to such concerns in respect to our professional work output. There are well-founded controversies about the deceptive nature of "photoshopping" images; of photographs doctored into idealized or fantasized depictions of reality; of presenting images of "things that never were," and even things that cannot be.

Photoshopping is now commonplace, with the airbrushed perfection of advertising models and centerfold beauties being perhaps the most obvious example. Concern about the accurate portrayal of visual reality is particularly important when it comes to educational and archival image collections such as those found in our schools, museums, archives, and libraries. Ethical issues are critical to all of us who work for these institutions of culture and learning, both because of our professional responsibilities and as a matter of organizational policy and practice.

Especially in our environments, we are duty-bound to address the question of whether an image is true and accurate or is a modified, perhaps even a fraudulent, copy or version. Copyright law is always the basic legal guide here, but our concern is focused on the professional demands of due diligence. Here, you may be obligated to make an editorial, management, or organizational judgment call, seriously considering a specific legal and policy question.

In archival collections, for example, the prime professional and organizational intent is to maintain a collection of authentic and original materials; if you retouch or modify an original image, you are obviously exceeding the limits of your archival role. Some typical archival examples include the following:

- Newspaper or publishing archives, in which the material is kept not only for information and internal use, but also as "proof of publication." There are legal and regulatory compliance requirements to be met; you obviously can't tamper with the printed record.
- Government archives, in which the integrity of the "real stuff" is strictly regulated—for good reason.
- Special-purpose archives that store medical, legal, financial, insurance, property/title, and similar records.

Even in these formal archival settings, post-processing is sometimes tolerated or viewed as necessary. I discussed this "alteration" issue with retired archivist Virginia Newton (Newton, 2012) of

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San Antonio, Texas, whose background includes management at the Alaska State Archives and later at the archives of the Organization of American States (OAS). She immediately confirmed that although an original archival item must always be preserved in its original or pristine state to meet archival collection requirements and policies, she also believes that the retouching and restoration of photographic images is appropriate in many cases. For example, retouching a damaged or defaced historic image or document purely for restorative, cosmetic, or reproducibility purposes is professionally acceptable—in her view.

Summarized, Newton's interpretation and practical guidance is as follows:

- 1. Never modify or make changes to any original print or image, but confine post-processing work to digital or photographic copies of the original.
- 2. Never present an image as the authentic original unless it is *and* you can prove it.
- 3. Take the prudent precaution of clearly labeling or identifying a post-processed image as a "restored" or "altered" copy.
- 4. Always require printed credit for an image from the archival collection, and ensure prominent notification of any alteration or restoration to the original image that may have occurred.

Beyond applying professional ethics as your guide, your own organizational and legal policies must, of course, always be paramount in this area of ethical concern.

#### Journalistic Accuracy Concerns

The "reality" controversy extends to the use of altered images in "real" journalism. News publications, broadcasters, and other mass media outlets must especially avoid the modification of photographic images in their editorial products to preserve their implied validity, accuracy, and credibility. Most publishers certainly want to avoid giving any impression of trying to change or rewrite history, but it can happen.

A classic example of photographic historical revisionism is the well-known Soviet alterations whereby which likenesses of Leon Trotsky and others were removed from photos that showed them in the company of Joseph Stalin.

A more recent American example of this same revisionist issue was *Time* magazine's alteration of a police mug shot of O. J. Simpson, used on the magazine's cover of June 27, 1994. Simpson's face was altered to appear as darker, blurred, and unshaven. The photographer who manipulated the picture said he "wanted to make it more artful, more compelling" (Lucas, 2012), but the point here is that the modified image artificially portrayed Simpson as a more sinister and suspicious character than the original shot might have suggested. *Time* received widespread negative criticism for permitting the alteration and publication of this particular photograph.

There's often a fuzzy line of reality versus acceptable professional photo alteration. Most professional photographers exercise artistic license in making relatively minor cosmetic changes in exposure, brightness, contrast, and minor retouching of unsightly facial blemishes. In many situations, this is considered a normal part of producing a good photographic image or print.

However, we can see television news broadcasters pushing this line daily with their use of "green screen" composite images in regular news broadcasts. This technical effect portrays persons as appearing "on the scene" in front of courthouses, buildings, political conventions, bookshelves,

stormy background scenes, or background cityscapes, whereas in reality they are in a studio, posed in front of an artificially generated background. Another example of this televised "artful deception" is the substitution of better lit, more flattering or attractive close-up shots of interviewers or interviewees asking or answering questions—shots that were actually taken on location *after* the actual interview was completed. I personally don't think it's right that a "hard-hitting, on-the-scene" investigative reporter or broadcast news team should have the option of splicing "Question 4, Take 3" into an interview and then representing the video as reality—but, for all I know, it may be within established broadcast guidelines.

In contrast, we expect this kind of artistic excess when employing a local portrait or wedding photographer. They certainly don't represent their idealized portraiture or dreamy, romantic representation of a wedding event as anything remotely resembling reality; we all know and accept that it's essentially a staged representation of a memorable actual event.

And then there's the case of "serious photography." Surely, we expect authenticity from photographic masters such as Ansel Adams, Edward Weston, Robert Capa, and Dorothea Lange. Those greats may not have employed a great deal of post-processing in their work, but they were all preand post-processing geniuses in their mastery of photographic technique. They controlled and manipulated exposure times, lens f/stop settings, and burning and dodging (deliberate over- and underexposure of smaller areas within printed images).

But even in serious photography, it's expected that a photographer will make efforts to remove dust and spots—maybe even an intruding housefly—from an otherwise gorgeous image. Furthermore, we don't criticize Mathew Brady for meddling with reality in his Civil War depictions. We all know that he was restricted to staged after-action scenes, when he was able to set up his bulky view camera equipment along with all the apparatus needed to support his wet collodion glass plate negative processing. His technology didn't give him the luxury of being a realist, as are modern combat photographers, but we knowingly accept and respect the validity of his photographic representations.

In any case, digital image manipulation technology has completely changed our view about the dependability of photographic depictions. As recently as 1932, Ansel Adams wrote that "the camera is incapable of synthetic integration" (Brower, 1998, 94). In his 1998 *Atlantic Monthly* article, Kenneth Brower noted, "Synthetic integration . . . is now [actually] full upon us. . . . More and more digitally-doctored images are appearing in the media." Brower further concluded, "Digital technology now allows photographers complete freedom to rearrange reality according to their whims" (Brower, 1998, 111).

We must allow that retouching and restoration is completely legal and appropriate in many everyday applications. Perhaps television "virtual reality" and fine-art photographic printing are concerns distinct from the responsible use of post-processed images. But I think we must pay attention to ethical concerns about the alteration of reality, because we have the responsibility to evaluate it in the contexts of both our particular projects and our specific professional environments. Thus, when there's a question of using altered photo images, you must be guided by your personal ethical standards, the policies of your organization, and any statutory and regulatory law that may apply.

#### Journalistic Policy Models

It is instructive to examine the question of professional practice in the area of journalism. This industry predictably shows a wide spread of ethical practices in the use of post-processed images. University of Miami faculty member Michelle Seelig conducted a case study of photographic

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retouching practices at the *Philadelphia Inquirer*, which she published in *Visual Communication Quarterly* (Seelig, 2006). She observed, "With recent developments in photographic retouching and refinement, such as airbrushing and digital imaging software, and as laypeople learn they are capable of manipulating images, the construction of photographs, including news photographs, has become a matter of popular public discourse."

The *Inquirer* cooperated fully in Seelig's analysis of their practice, which covered their use of photographs from 2001 to 2003. Her examination of the newspaper's photo archives revealed that a significant number of photographs from the 1950s–1970s had been hand-retouched or airbrushed, including by adding and deleting backgrounds and even removing persons from photos. Seelig reported that these altered photos were often published with no printed notice of the changes that had been made. She documented an organizational sea change in the 1980s, resulting in a written policy being inserted into the *Inquirer* style manual late in that decade. The new policy stated that under no circumstances were photos to be manipulated. This explicitly included prohibition on sharpening and blurring images, deleting and adding information, coloring specific elements in an image, and distorting or stretching images. Seelig commented that, "This new policy was put in place by a person who believed that regardless of what the technology can or cannot do, you do not manipulate a news photo" (Seelig, 2006, 18).

In her 1987 paper, Sheila Reaves of the University of Wisconsin–Madison reported on her early investigation of the ethical concerns arising from the new digital publishing technologies (Reaves, 1987). She selected the *Santa Ana* (CA) *Register* (circ. 300,000), the *Chicago Tribune* (circ. 755,000), and *USA Today* (circ. 1,352,000) as a representative sample of the industry. She interviewed at least two senior editorial managers with photographic responsibilities from each newspaper, as well as three former presidents of the National Press Photographers Association. Her findings revealed many similar views on the topic of photo alteration, as well as some surprising disagreements.

Reaves's interviewees were unanimous in their support of minimal post-processing of news photos. They agreed on the propriety of cropping, burning, and dodging but stated that reversing or flipping images, changing or deleting backgrounds, and splicing together different images were all unacceptable practices. ("Reversal" means inverting an image left-to-right, resulting in text and left/right orientation being reversed; "flipping" means inverting the image top-to-bottom, with the new image appearing upside down, but not reversed.)

Writing about the ethics of editorial responsibility and commitment to truth, Reaves quotes the late Robert E. Gilka, one-time director of photography at *National Geographic*, from a *New York Times Magazine* article. Gilka, referring to the retouching and manipulation of news photos, said, "It's like limited nuclear warfare. There ain't none" (Reaves, 1987, 43).

Perhaps surprisingly, a number of Reaves's interviewees felt that a strict prohibition on using altered photographic images should be limited to a newspaper's news department. These editors felt that feature photographs could be responsibly post-processed. One individual noted that although his news department was opposed to any alteration or manipulation of photos, his features and advertising departments openly supported the practice, the reasoning being that these latter divisions are not represented as providing factual reporting, but rather as entertainment, enjoyment, and diversion.

Some of the examples given of acceptable alterations outside the newsroom included the changing of background color in a fashion photo, substituting background imagery to fit a story concept, introduction of cosmetic changes such as removing background clutter, and retouching facial blemishes. The editors agreed that splicing photos to produce collages or constructed images for use in

feature sections was also permissible, because it was obvious, purely stylistic, and clearly done for illustrative or design purposes. There was general agreement that images of this sort are not intended to represent reality, and that readers understand and accept the practice.

These interesting points demonstrate the breadth of interpretation possible among experienced and responsible media professionals, as well as a number of areas in which there is agreement. Although I understand their reasoning for a "sliding scale" of ethics, I recommend caution and alertness to gray areas. Take sports page photos, for example: Are they provided for news, or for entertainment purposes? What about fanciful images cobbled together to accompany a story about winter blizzards or global warming? What of the book review section? The cooking section? What properly distinguishes the acceptable use of enhanced or subtly exaggerated "illustrations" from that of unambiguously fictive cartoons and caricatures?

As we have seen, a wide spectrum of policy views and practice exist in the American media, ranging from no alteration whatsoever to minor cosmetic alteration to improve the general visual appearance of an image to playing fast and loose with image modification. This wide range of practice and policy will probably continue, depending largely on how individual media operations view the editorial accuracy and objectivity of their brands. No federal regulation currently covers this area of practice, but some individual states, regional, and local political entities; nonprofit organizations; and corporations have established their own rules and guidelines.

As an example of an effort to support sound policy in this area, the Photographic Society of America Nature Division (PSA ND) has long observed the rule that "any form of manipulation that alters the truth of the photographic statement" renders an image ineligible for exhibitions or competitions recognized by the PSA ND. This guideline, developed during the silver print era, continues to be widely followed by member professional photographers in respect to their digital work.

The PSA ND has adopted the following short statement into its code of practice:

No techniques that add to, relocate, replace, or remove pictorial elements except by cropping are permitted. Techniques that enhance the presentation of the photograph without changing the nature story or the pictorial content are permitted. All adjustments must appear natural. Color images may be converted to grayscale monochrome. (www.psaphoto.org/index.php?nature-code-of-practice)

The PSA ND statement is restrictive in regard to any modification of "factual detail" or information content, yet it does not exclude the conscientious use of cropping and other techniques for optimizing image presentation "without changing the nature story or the pictorial content." I recommend this as a responsible model for library, archives, museum, and education professionals working with photographic images.

#### Automated Detection of Photo Image Retouching

One might think it would be difficult, if not impossible, to determine whether a particular image has been modified, and even more challenging to judge the degree of modification. Surprisingly, this appears not to be true. Dr. Hany Farid and Eric Kee, a Dartmouth University computer science professor and a PhD student in computer science, respectively, have published a paper describing a software approach to conducting this type of analysis (Kee and Farid, 2011).

Farid and Kee recruited hundreds of people online to compare "before-and-after" photo images. They ranked the pairs from 1 to 5, from minimally altered to starkly changed, respectively. The

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human rankings paired with the actual final image files were then analyzed to guide the creation of an algorithm that would analyze the modified final images and produce closely similar rankings of the human test rankings. I conclude that these researchers did not measure the degree of change between original photo A and modified photo B, but rather the minute physical post-processing changes to the pixels in the final modified photo. However, I don't believe this is a practical guide for ranking image modification. For example, a post-processing adjustment in brightness level or contrast or the "sharpening" of a blurred image would make changes over a wide area, changing a large number of image pixels. This is actually a relatively innocuous technical *improvement* to an image, not actually something to produce a higher critical ranking level. Humans looking at such an image might easily grade such a post-processing change as an improvement.

Dr. Farid suggests that his software offers an objective practical approach to effective self-regulation by media companies. Professional organizations, publishers, and corporations could evaluate and fine-tune the software performance, perhaps using or developing the resulting ranking scale as a guide or tool for publishing practice. This would be similar to the established media use of objective "reading-ease" or "grade-level" software tools for judging the readability of editorial content. Such software includes the Flesch Reading Ease Formula, the Flesch–Kincaid Grade Level scale, and the Gunning FOG Formula. (For more information, see www.readabilityformulas.com.)

As demonstrated by the preceding discussion, I agree that there is a sensible spectrum or range of allowable photographic image alterations. One must always be sensitive to any possibility of the deliberate and subjective modification of reality or information. It is also important to allow professional publishers or media practitioners some flexibility in editorial control over the appearance and quality of their published products.

Farid feels that such an evaluation tool could easily provide monitoring indices to control or reduce excessive retouching: "Models or photographic subjects, for example, might well say, 'I don't want to be a 5. I want to be a 1.'" (Lohr, 2011) Similarly, an organization might adopt a requirement that its photo-editing manipulation processes not produce a photo with a rating above 2.5, or some other selected level of post-processing.

#### Neural Network Programs as an Alternate Approach

I think it might be more productive to use the artificial intelligence approach of neural network processing. A neural network program could instead analyze the human-decision ranking values of the "before" and "after" photo images, comparing these to the corresponding actual before and after photo images. The software would analyze all the rankings to the corresponding image patterns and try to construct a "brainlike" reasoning process to approximate the human decisions. It would then run its "best guess" process against the full test set, trying to arrive at the same human rankings.

When the neural network's rankings differed from the human rankings for the full set outside a defined accuracy level, the software would then automatically repeats the analysis, modifying some of the processing details, trying to correct the ranking variances, thereby creating an improved process. This operation would then be repeated over and over again, for tens or hundreds of thousands or millions of cycles (as many as are needed), until the human rankings and computed results are similar within the desired accuracy level.

The neural network approach is literally "machine learning," whereby the computer automatically creates some kind of automated process to mimic the real-life human test data. It thus "learns" how to become an expert at a given process. Humans will have no idea of the details of the automated analysis and operations. If it works, that's because *it just works*. The neural

network creates a "black box" (closed or unknown process) that nevertheless produces the desired results.

Neural networks don't have to depend on "test sets." Many existing business, control, and intricate monitoring and pattern recognition processes are now produced with neural networks that have analyzed years of actual transaction data records or output results. Neural networks are commonly used to evaluate investment strategies, complex manufacturing or production controls and processes, home loan applications, inventory control, insurance actuarial methods, fleet vehicle maintenance and repair, and hospital operations, among many other complex processes.

These neural network operational applications benefit from existing archives of detailed computer records of years of actual practice and results, which provide excellent learning data sets. It is quite productive to let a computer run a neural network application analysis for hours or days or weeks to produce an "expert system" that can perform complex analysis and decisions and match the performance of the enormous historical sets of actual experience. Even the cost of providing a dedicated personal computer or workstation for doing this will only be a fraction of the cost of system analysts and programmers needed to manually devise a comparable "intelligent system."

The neural network approach can thus package heuristic judgments into a fast, efficient, and effective automated ranking tool. Instead of simply calculating "the degree of visual detail post-processing" in a final image, it would deliver reliable, accurate, and reproducible judgment of the human perception of the degree of post-processing changes. Such neural network post-processing ranking judgments could easily be regularly revised and overseen, perhaps by comparing the choices made professional practitioners or industry representatives working toward a valid professional guidance method.

#### The Professional's Bottom Line

The Digital Photo Magic approach was designed to help librarians, archivists, teachers, and museum professionals responsibly retouch, use, share, and preserve photographic images in digital formats and environments. In this chapter, we've explored the potential benefits of DPM and considered issues affecting its adoption, including legal and ethical issues that need to be considered. In the following chapters, I cover digital image and post-processing basics, explain specific fixes and results you can achieve with DPM, and introduce a solid collection of free and inexpensive tools and methods for retouching and restoring your valued photographic images and collections.

If you have read this far and still intent on saving time and money while improving your ability to deliver quality results to your users, then read on. The best is yet to come.

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### **About the Author**



Ernest Perez, Ph.D., was most recently Group Leader for Reference Services, Technical Services, and Automated Systems at the Oregon State Library, Salem. Oregon.

A native of San Antonio, Texas, Ernest has a BA in Journalism from the University of Texas at El Paso, an MS in Library Science from the University of Texas at Austin, and a Ph.D. from Texas Woman's University, Denton, Texas.

Ernest's academic library experience includes working at the University of Texas–Austin Libraries, the Southwest Texas State University Library, and the Texas Woman's University Library. In special libraries, he was Library Director at both the *Houston Chronicle* and *Chicago Sun-Times*. At the *Sun-Times* he also worked as Circulation Department Administrator and managed the department's Automation Task Force.

A leader in the development of full-text databases at both the *Chronicle* and *Sun-Times*, Ernest was a recipient of the

Henebry Award from the Newspaper Division of the Special Libraries Association (SLA) for his contributions in the automation area. He led numerous seminars and presentations on the topic for the American Press Institute, the Southern Newspaper Publishers Association, and the Inland Daily Press Association.

Ernest's recent interests and projects have included the design and production of networked and online information services for Oregon State employees, web database migration of the statewide cooperative Oregon Index, conversion and web database migration of the Oregon Union List of Serials, development of the Find-OR GILS system for the State of Oregon, startup of the Libs-OR electronic mailing list for the Oregon library community, coordinating the testing of a prototype statewide shared catalog and ILL system in Oregon, and managing the hosting of over 300 mailing lists for Oregon State agencies and regional and national library interest groups.

True to his undergraduate journalism major roots, Ernest is a frequent contributor to the library professional literature. He has published more than 150 articles and book chapters, served as a contributing or associate editor for numerous journals, and was editor of the Sage Publications journal, *Library Computing*.

A serious longtime amateur photographer with a deep interest in digital image-processing tools and techniques, Ernest resides in Roseville, California. *Digital Photo Magic* is his first book.

If you enjoyed reading this chapter of *Digital Photo Magic*, you can order it from the following online retailers.





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