2012 :15th SESSION of ESMP

Lecture presented in Archamps (Salève Building) by :

Karl-Freidrich KAMM (Hamburg)

Tutorial
Digital Imaging

PC exercises with
ImageJ
Medical Image Processing Software

Karl-Friedrich Kamm

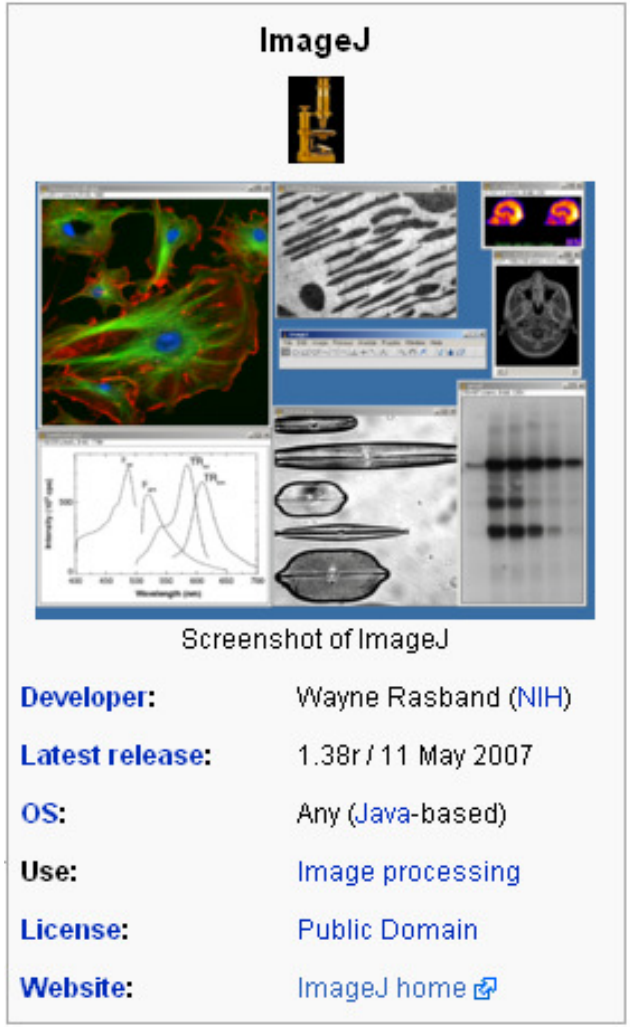
European School of Medical Physics - Archamps

Image processing program ImageJ

- intuitive operation
- free software for PC

  http://imagej.nih.gov/ij/
- programmed in Java
- independent on platform
- well suited for medical images
- application software from many institutions

  Plugins



ImageJ

- Developed by Wayne Rasband

  wayne@codon.nih.gov
- latest program version: 1.47
- NIH: National Institutes of Health (NIH) Washington, USA.
  - Yearly budget : 28 Mrd. US-$
  - about 28 % of all expenses for biomedical research in the USA.

Workshop

- Perquisites:
  - ImageJ should be loaded at each computer.
  - as test images we will start with the SMPTE TEST PATTERN
  - CDs with further test images and medical images will be brought to the workshop by the lecturer.

1. Introduction to ImageJ
2. basic functions: menu commands, windows, tools, status bar and memory management
3. Image analysis, histogram, dynamic range,
4. Image processing, image enhancement, measurements
5. hands on and discussion

Short description:

- Image processing program for Windows and Apple PCs.
- Firstly developed 1983 for the Apple Macintosh
- Freeware. The source code is freely from the ImageJ website. http://imagej.nih.gov/ij/
- There are distributions available for Windows, Mac OS, Mac OS X, Linux
- It is important to load also the plugins
- The program functionality can be expanded using a macro scripting language and via plugins written in Java.

More information under the address: (Wikipedia)
http://imagejdocu.tudor.lu/imagej-documenation-wiki/faq

Homepage of NIH ImageJ

applications

http://www.santec.lu/project/optimage

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OPTIMAGE – A SOFTWARE TOOL THAT PROVIDES A HIGHER LEVEL OF IMAGE QUALITY CONTROL FOR RADIOLOGY DEPARTMENTS

DEVELOPED IN PARTNERSHIP WITH REGIONAL HOSPITALS AND THE LUXEMBOURG MINISTRY OF HEALTH, OPTIMAGE IS AN OPEN SOURCE SOFTWARE THAT PROVIDES AUTOMATED IMAGE ANALYSIS FOR QUALITY CONTROL IN MEDICAL IMAGING MODALITIES.

Test Image AAPM TG18 – QC quality check

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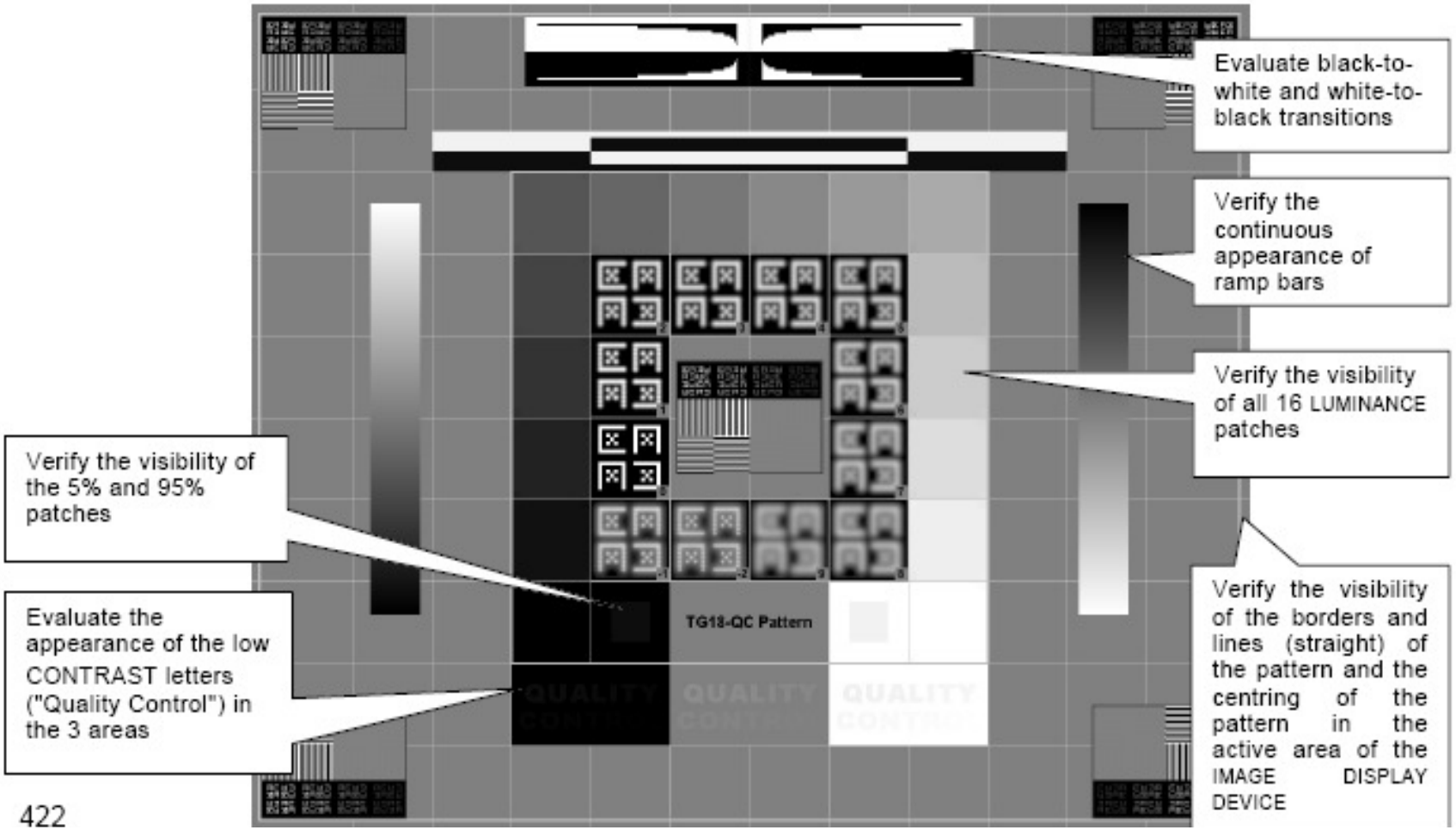

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American Association of Physicists in Medicine (AAPM), Task Group 18

Assessment of Display Performance for Medical Imaging Systems

NA 080-00-16 GA N 12

62B/664/NP

NEW WORK ITEM PROPOSAL

	Proposer Secretariat	Date of proposal 2007-08-01
	TC/SC SC 62B	Secretariat Germany
	Date of circulation 2007-08-03	Closing date for voting 2007-11-09

A proposal for a new work item within the scope of an existing technical committee or subcommittee shall be submitted to the Central Office. The proposal will be distributed to the P-members of the technical committee or subcommittee for voting, and to the O-members for information. The proposer may be a National Committee of the IEC, the secretariat itself, another technical committee or subcommittee, an organization in liaison, the Standardization Management Board or one of the advisory committees, or the General Secretary. Guidelines for proposing and justifying a new work item are given in ISO/IEC Directives, Part 1, Annex C (see extract overleaf). **This form is not to be used for amendments or revisions to existing publications.**

The proposal (to be completed by the proposer)

Title of proposal

MEDICAL ELECTRICAL EQUIPMENT -
Medical Image Display Systems – Part 1: Evaluation methods

author of ImageJ Wayne Rasband

- (wayne@codon.nih.gov), Research Services Branch, National Institute of Mental Health, Bethesda, Maryland, USA, (http://rsb.info.nih.gov/ij/).

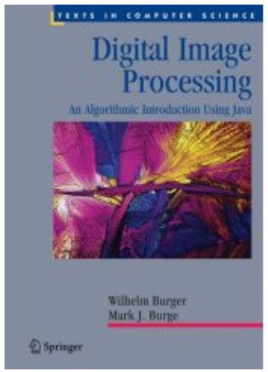
- ImageJ is a medical image processing software developed and put in the public domain (old-style definition, but definitely valid) with source code included by Wayne Rasband. The software is inspired by a previously created and carefully maintained software named NIH-Image, which was available for Macintosh and ported to Windows by a third-party.

- Wayne Rasband is working as software developer at the National Institutes of Health for 35 years. In the 70s he developed image analysis software for the PDP-11 minicomputer. From 1983 to 1996 he worked on the NIH Image program for the Macintosh. From 1997 to the present he has been working on ImageJ. He has a masters degree in computer science from the University of Maryland.

ImageJ
User & Developer Conference
18th & 19th of May 2006

European School of Medical Physics - Archamps

Literature



Digital Image Processing: An Algorithmic Introduction using Java (Hardcover)
by Wilhelm Burger (Author), Mark James Burge (Author)

List Price: $69.95
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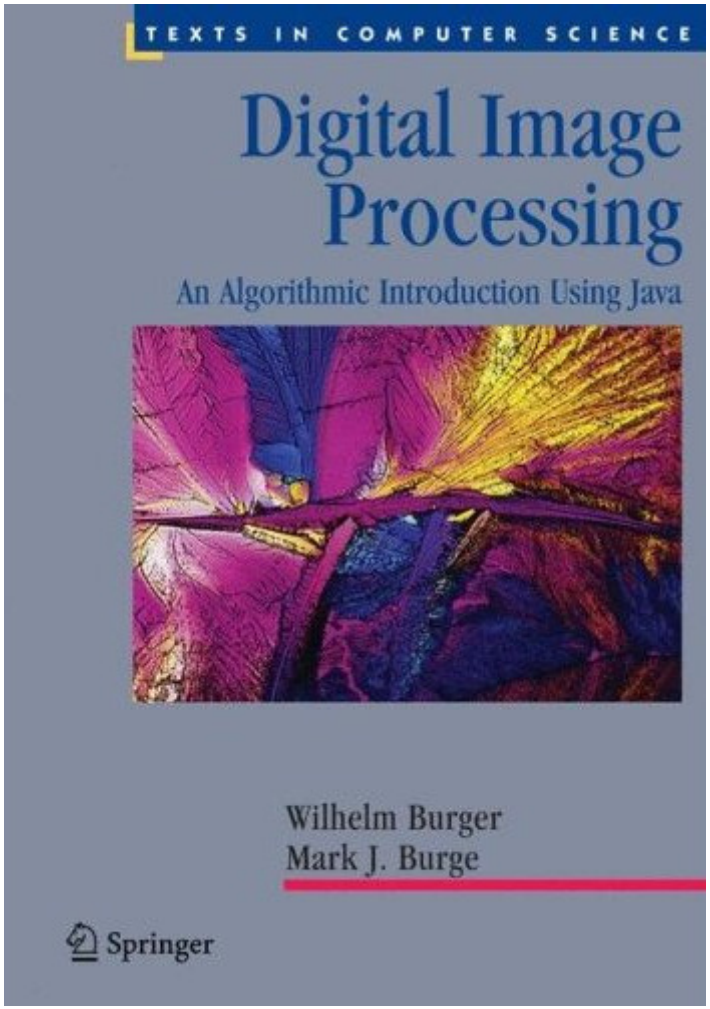


Digital Image Processing
An algorithmic introduction using Java

Burger & Burge

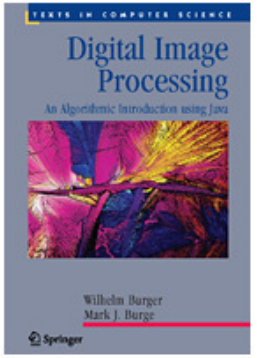
Springer Verlag

Wilhelm BURGER • Mark J. BURGE

Digital Image Processing

An Algorithmic Introduction using Java

ISBN: 978-1-84628-379-6
Textbook with 560 pages, 271 figures and 17 tables



This book provides a modern, self-contained, introduction to digital image processing. We designed the book to be used by both learners desiring a firm foundation to build on, and practitioners in search of critical analysis and modern implementations of the most important techniques. This is the first English edition of the original German language book which has been widely used by:

- Imaging professionals, scientists, and engineers who use image processing as a tool and wish to develop a deeper understanding and create custom solutions to imaging problems in their field.
- IT professionals wanting a self-study course featuring easily adaptable code and completely worked out examples enabling them to be productive right away.
- Faculty and students desiring an example rich, introductory textbook suitable for an advanced undergraduate or graduate-level course which features exercises, projects, and examples which have been honed during the author's years of teaching.

While we concentrate on practical applications and provide working implementations, we do so without glossing over the important formal details and mathematics necessary for a deeper understanding of the algorithms.
In preparing this text we started from the premise that simply creating a recipe book of imaging solutions would not provide the deeper understanding needed to apply these techniques to novel problems, so instead our solutions are developed stepwise from three different perspectives: (a) in mathematical form (b) as abstract, pseudocode algorithms and (c) as complete Java programs. We use a common notation to intertwine all three perspectives, providing multiple, but linked, views of the problem and its solution.

The first English language edition, which expands on the second edition of the German text, was published in September 2007 by Springer-Verlag. Please see the preface and the table of contents. Numerous complete Java implementations are provided, all of which work within ImageJ, the programmer extensible imaging system developed, maintained, and distributed by Wayne Rasband of the National Institutes of Health (NIH).
This book is available NOW!

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Welcome to the homepage of the ImageJ Conference series.

We are currently preparing the ImageJ Conference 2012, which will take place the 24th - 26 October 2012 in Mondorf-les-Bains, Luxembourg. With 85 papers received during the call for paper period, the community has shown its productivity. As most of the submissions are of high quality, the Scientific Committee had an hard job selecting the contributions. The submitted papers and workshops deal with versatile topics. We are certain of having been able to design a high quality and interesting programme for beginner level users as well as for experiences plugin developers. At the request of the visitors of the conferences in 2010 we try a slightly different design. The conference has now a single track presentations schedule enabling the visitor to attend all conference sessions. To ensure a high number of talks, we have reduced the presentation duration from 30 to 15 minutes. With 22 scientific presentations and 4 key notes, the programme even includes eight additional talks. This year, the keynotes and the hands-on workshops do focus on the new ImageJ 2.0 development and the underlying ImgLib2 library to account for their new possibilities. The increased scientific poster presentation is organised similar the one of the last years. The round table discussion of the last years has been replaced by thematic sessions that can be initiated by the conference participants.

We would like to invite you to register for the conference during the early bird registration period with lasts **until 14. September 2012**. We hope to see you at our conference in October!

The Organisation Team

Interested in sponsoring the conference?

Download our sponsor conditions (deadline 05. October 2012).

Important Dates

Find below our schedule until October. If you would like to stay informed, please leave your contacts for the conference newsletter.

01.10.2011 01.02.2012	-	Internal organisation
09.03.2012 27.06.2012	-	Call for workshop / presentation / poster / expo
15.07.2012		Notification of Acceptance
16.07.2012		Conference Program
16.07.2012 **14.09.2012**	-	**Visitors Registration (early-bird price)**