2-day Practical Course on

**FUNDAMENTALS OF APPLIED MEDICAL IMAGE PROCESSING**

**WITH PRACTICAL EXAMPLES USING MATLAB, 3DSLICER AND ITKSNAP FOR 3D VISUALISATION**

*By ASSOC PROFESSOR WOLFGANG BIRKFELLNER*

*Head of Digital Image Processing Laboratory*

*Centre of Biomedical Engineering and Physics*

*Medical University of Vienna, Austria*

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**Kuala Lumpur:**

23 & 24 Sep 2013 (9.00 am to 5.00 pm)
The Royale Bintang Kuala Lumpur Hotel

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**Singapore:**

26 & 27 Sep 2013 (9.00 am to 5.00 pm)
Holiday Inn Singapore Orchard City Centre

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This is hands-on practical course using MATLAB, 3Dslider and ITKSnap. Participants are expected to bring along their lap-top computers for the workshop.

This course is designed for anyone interested in acquiring practical understanding of the fundamentals of medical imaging without any prior knowledge of image processing, advanced mathematics or programming.

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TEKBAC (M) Sdn Bhd is a Registered Training Provider with Ministry of Human Resources, Malaysia under the SBL Scheme. Eligible employers may claim from the HRDF for funding of the workshop fees.

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This course is based on the book, “Applied Medical Image Processing: A Basic Course”, by Prof. Wolfgang Birkfellner, CRC Press, 403 pages, hardcover.

Each participant will receive a complimentary copy of this book.

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**Summary**

Based on the author’s decades-long tenure in clinical environments and their extensive teaching experience, *Applied Medical Image Processing: A Basic Course* introduces the basic methods in applied image processing without assuming that readers have extensive prior knowledge beyond basic applied mathematics, physics, and programming. Illustrated with simple, well-commented MATLAB® examples, the book’s tangible and accessible presentation demonstrates real-life applications.
Introduction

Image processing is a prosperous field of research with a considerable impact on the medical device industry. While many techniques applied in the medical field are well covered in the general image processing literature, some specific challenges and problems remain.

Among those are the basic physics of medical imaging, which are responsible for producing data completely different to what is considered an image in the general public, and the fact that many of the images are three-dimensional, which is also an uncommon feature.

The course aims at giving an overview of the special problems in medical image processing for the medical field.

Objectives

The course will provide the following technical knowledge, which is deepened by hands-on examples using MATLAB:

- Understanding of the specific terminology and the objectives of utilizing different imaging modalities in clinical practice.
- Using medical image file formats for research and development work.
- Using simple intensity and filtering operations on medical image datasets
- Developing a basic understanding of common segmentation and multimodal image registration techniques

Who will benefit from this workshop

Anybody with a general background in mathematics and basic MATLAB, and an interest in image processing applied in medical imaging.
Outline of Topics

DAY 1

Session 1:
Short introduction to medical image data acquisition including common modalities such as computed tomography, magnetic resonance imaging and molecular imaging techniques such as SPECT and PET; short overview of medical imaging physics and of clinical applications of medical image processing.

Session 2:
Basics of medical image formats; handling of medical image data using practical examples in MATLAB and 3DSlicer.

Session 3:
Basic image operations in intensity space; windowing and nonlinear image intensity transforms. Practical examples using MATLAB and 3DSlicer.

Session 4:
Filtering and Convolution operations on medical image datasets.

DAY 2

Session 1:
Segmentation; introduction to general problems and selected application examples using MATLAB and ITK-Snap.

Session 2:
Spatial transforms in 3D space.

Session 3:
A few practical examples of 3D visualization of tomographic medical image data using volume rendering techniques.

Session 4:
Basics of multimodal image registration including selected examples in MATLAB and 3D Slicer.

Course Leader:
Associate Professor Wolfgang Birkfellner

Wolfgang Birkfellner was born in 1970 in Steyr/Upper Austria. After school in Austria and Germany, he started studying Physics at the University of Vienna in 1990, and graduated in 1996 in theoretical physics. In 2001, he finished his PhD in Medical Physics. From 2001 to 2003 he was a senior researcher at the University Hospital Basel/Switzerland. He became an associate professor of medical physics at the Center for Biomedical Engineering and Physics of Vienna Medical School in 2004.

His research interests include medical image processing, medical physics, image-guided therapy and image-guided radiation oncology. He has authored or co-authored more than 100 peer reviewed journal and conference proceedings articles, which were cited approximately 1100 times in the literature. Currently, he is heading the Digital Image Processing Laboratory at the Center for Biomedical Engineering and Physics at the Medical University Vienna. He is also a reviewer and editorial board member for major journals in the field (Medical Physics, Physics in Medicine and Biology, IEEE TMI), program committee member for several international conferences (MICCAI, SPIE Medical Imaging) and principal investigator for several third-party funded research projects.
COURSE ON FUNDAMENTALS OF APPLIED MEDICAL IMAGE PROCESSING  
Presented by Associate Professor Wolfgang Birkfellner - Sep 2013

Register Now:  
By phone : (65)-6877 9275  
By email : tekbac@singnet.com.sg  
Enquiry : Please contact Cynthia on the phone or email

REGISTRATION FEES

<table>
<thead>
<tr>
<th>Course Fee</th>
<th>Singapore (S$) (No GST)+</th>
<th>Kuala Lumpur (RM)</th>
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<tbody>
<tr>
<td>Individual Fee</td>
<td>990.00</td>
<td>1,990.00</td>
</tr>
<tr>
<td>Group Fee*</td>
<td>890.00</td>
<td>1,890.00</td>
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* Send three or more delegates from the same organisation at the same time and **each delegate** is entitled to this group fee.

+ We are not GST-registered.

Registration fee includes lunch, refreshments, full training documentation and book by Assoc. Prof. Birkfellner. The fee does not include hotel accommodation.

Payment terms: **Fee must be paid before the event.**

Methods of Payment

**Singapore event:**
Please make payment in Singapore dollars using crossed cheque in favour of TEKBAC Singapore Pte Ltd.

**Malaysia event:**
Please make payment in Malaysia Ringgit using crossed cheque in favour of TEKBAC (M) Sdn Bhd. We accept Local/Purchase Order prior to payment.

CANCELLATION POLICY

All cancellations must be made in writing by fax, email or post. If you are unable to attend,

- A substitute delegate is welcomed at no additional charge.
- Your registration fee paid can be credited to a future event.
- You will receive a full refund less 10% administration charge if cancellation is received in writing more than 14 days before the event.

No cancellations will be accepted within 14 days of the date of event. Full documentation will, however, be sent to the delegate.

DISCLAIMER

TEKBAC is not liable for any claims should the course/workshop be cancelled or postponed due to circumstances beyond its control.

Time Schedule

The course starts at 9.00 am and ends at 5.00 pm daily. Please arrive at 8.30 am on day one to allow time for registration and collection of documentation. Lunch is from 12.30 pm to 1.45 pm. There will be two refreshment breaks at 10.30 am and 3.30 pm.

CERTIFICATE OF ATTENDANCE

This training programme is designed to meet to your continuing professional development. A Certificate of Attendance indicating the no. of training hours will be awarded at the end of the programme. This serves as evidence of your commitment to your career.

REGISTRATION FORM

Fundamentals of Applied Medical Image Processing  
☐ 23 & 24 Sep 2013 Kuala Lumpur  ☐ 26 & 27 Sep 2013 Singapore

Contact Person:
Name: Dr/Mr/Mrs/Ms* ________________________________
Job title: __________________________________________
Organisation: ______________________________________
Dept: ____________________________________________
Address: _________________________________________
Tel: ______________________ Fax: ____________________
Email: ___________________________________________

Delegate 1:
Name: Dr/Mr/Mrs/Ms* ________________________________
Job title: __________________________________________
Faculty/Dept: ______________________________________
Email: ___________________________________________

Delegate 2:
Name: Dr/Mr/Mrs/Ms* ________________________________
Job title: __________________________________________
Faculty/Dept: ______________________________________
Email: ___________________________________________

Delegate 3:
Name: Dr/Mr/Mrs/Ms* ________________________________
Job title: __________________________________________
Faculty/Dept: ______________________________________
Email: ___________________________________________

Please fax or email the completed registration form to (65) 67672961 
*Please indicate accordingly.