

MICCAI 2010 Tutorial Proposal

Title:

**Best Practices for Software Development in the Imaging Community:
Users and Developers Unite!**

Outline: Scientific meetings are often bursting with the latest findings that advance the overall knowledge of the individual researchers involved in specific research topics. What is under-addressed, however, is the necessary details (infrastructure, techniques, resources, etc.) necessary to promote excellent ideas and advances from one investigator to the remainder of the community. In many cases, such advances are embodied in software applications; and the scientific community is, at times, woefully under-educated in the methods of software development and dissemination. This tutorial session is designed to provide developers and users a baseline understanding of methods and tools available to promote good software development practice, including software engineering and user-base interactions. The faculty includes experts in software dissemination and developers with long standing track records in community software development. The session will include presentations, community dialog and open demo sessions. Topics that will be addressed by all developers include best practices for: software testing, documentation, user communication, open file standards, meaningful error/warning messages, and tools/techniques for quality control/assessment.

Organizer: **David N. Kennedy, Ph.D.**
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Academic Objectives: The tutorial attendee will receive a state of the art, detailed update on the following topics:

- Methods for open source software development
- Methods for software distribution, including licensing issues
- Techniques for software validation
- Techniques for user interactions (documentation, tutorials, feedback/communication, etc.)
- Resources for finding existing relevant software projects.

Format Plans: This tutorial is planned for the half-day format (3 hours). This session will be lead by four 25 minute presentations by Drs. Luo/Kennedy (Neuroimaging Informatics Tools and Resources Clearinghouse: NITRC); Dr. Tao (3D Slicer3 extension modules concept and implementation); Dr. Landman (Java Image Science Toolkit: JIST) and Drs. Zhang/Yushkevich (open-source development projects ITK-SNAP & DTI-TK). This will be followed by a 30 minute panel discussion with questions from the audience. The final aspect of the tutorial will be a 50 minute open demo session (concurrent with coffee/tea service) where live presentations of each of the 4 presented software development projects will be on display to review specific implementation details for audience participation.

Anticipated Number of Participants: Virtually all MICCAI attendees are developers or users of advanced software systems. Thus, the scope of this tutorial can touch upon developers (looking for best practices and resources for better software development) and users (looking to find and optimize their experience with various software packages) alike. However, we anticipate that a manageable number (30-40), principally post docs and junior faculty, will commit to a half-day session dedicated to

these issues. This sub-group has the most to gain with respect to their personal careers to break in to the software market (using good development practices) and efficiently find the necessary, well-supported resources to assist their ongoing research. Good software development promotes the careers of both the developers (through better community adoptions of their work) and the users (who can do better research by utilizing resources that track with the cutting edge of their field).

Invited Speakers (all have tentatively accepted):

Xiaodong Tao, Ph.D.

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Bennett Landman, Ph.D.

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Requirements: Lecture room for 30-40 participants. Computer projection w/ internet access for lecture session. Four demo stations: presenters will bring their own computer, station should provide large screen monitor, poster board and internet connectivity should be provided for each station.

Dissemination: The organizers and presenters of this tutorial will provide information and resources supporting their presentations to the community using the Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC: www.nitrc.org). NITRC provides a forum that extends the impact of the tutorial and its material in time and audience. Collected best-practices manuscripts will be published as a Special Section in the journal Neuroinformatics (organizer is a co-editor in chief).