Training: Specific Aims

- We will deliver training programs for our collaborators and software users based on on-site workshops and off-site workshops, tutorials, short courses, training laboratories, webinars, and seminars.
- Yearly user and developer workshops on-site in Utah and Boston.
- Encourage direct one-on-one interaction with our collaborators and users through site visits by Center staff to the collaborators' laboratories or visits from collaborators or users to Center sites.
- We will develop short courses or symposia on scientific research topics in conjunction with targeted biomedical or clinical society meetings.
- General training and public awareness: We will seek nontraditional opportunities to educate the general public
- We will continue to hold the Center seminar series.
Training: Workshops and Course

Summer Course: SCI, CIBC and MRL hosts Summer Course on Image-Based Biomedical Modeling (NIH R25 Award)

ibbm.sci.utah.edu

Welcome to the Summer Course on Image-based Biomedical Modeling

July 10-20, 2017 - Park City, Utah

This course offers field-specific expertise and hands-on experience solving biomechanical problems that arise in current biomedical research and clinical practice. Participants will receive training in numerical methods, image analysis, and computational tools necessary to carry out end-to-end image-based, subject-specific simulations in biomechanics or biomaterials, using freely available software.

Presented by the Scientific Computing and Imaging (SCI) Institute, the Center for Integrative Biomedical Computing (CIBC), and the Musculoskeletal Research Laboratories (MRL).

We particularly invite participation from students in health-related careers belonging to underrepresented groups as defined by the NIH (find out more on the NIBIB Website).

Keynotes IBBM 2017:

Training: Workshops and Course

Previous Keynote Speakers

Igor Efimov, PhD
Department Chair, Allison and Terry Cotter
Professor of Biomedical Engineering
The George Washington University

Victor Barocas, PhD
Professor, Department of Biomedical Engineering
University of Minnesota

Elliot McVeigh, PhD
Professor, Department of Bioengineering
UC San Diego

Gerard A. Alekshian
Andrew Wiles Professor and Chair of Mechanical Engineering & Professor of Biomedical Engineering
Director, Musculoskeletal Biomechanics Laboratory

Natasha Traynerova, PhD
Murphy B. Bozs Professor, Johns Hopkins University
Department of Biomedical Engineering and Institute for Computational Medicine

Dimitris N. Metsaxas, PhD
Distinguished Professor of Computer Sciences, Rutgers University
Director, CBMR Center (Computational Biomechanics, Imaging, and Modeling Center)

Jeffrey W. Holmes, PhD, MD
Professor of Biomedical Engineering and Medicine, University of Virginia

Gerard A. Alekshian
Andrew Wiles Professor and Chair of Mechanical Engineering & Professor of Biomedical Engineering
Director, Musculoskeletal Biomechanics Laboratory

Dawn M. Elliot, PhD
Professor and Director of Biomedical Engineering, University of Delaware

Christopher Johnson, PhD
Distinguished Professor, Computer Science, University of Utah
Director of the Scientific Computing and Imaging (SCI) Institute
Training: Workshops and Course

Bioengineering Course: Introduction to Image Based Modeling (IIBM) (MacLeod and Butson)
2 CH, lab intensive.

Welcome to the Intro to Image Based Modeling (IBM) course for Spring semester 2017. This course is organized by Dr. Rob MacLeod and Dr. Christopher Butson, both in the Department of Bioengineering and the Scientific Computing and Imaging (SCI) Institute. The primary TAs for the course are Gordon Duffy and Andrew Janson. Lectures will be given by course faculty, TAs, and guest lecturers.

Information Links
- Lecture Notes and Background Information (TBD)
- People page for all the instructors
- IRB, HIPPA, IACUC training instructions

Preliminary Syllabus
1. Weeks 1-2 (Jan 10-23):
   1. Lecture 1 (Jan 10): Intro (Dr. Butson) and Image Basics I [Student Resources]
   2. Lecture 2 (Jan 17): Image Basics & Filtering [Student Resources]
   3. Lab 1: Image Basics
2. Weeks 3-4 (Jan 24-Feb 6)
   1. Lecture 3 (Jan 24): Segmentation I [Student Resources]
   2. Lab 2: Image Filtering and Thresholding
   3. Lecture 4 (Jan 31): Guest lecture: Dennis Parker (Radiology and UCAIR)
   4. Lab 3, Segmentation
Training: Workshops and Course

Bioengineering Course: Introduction to Image Based Modeling (IIBM) (MacLeod and Butson)
2 CH, lab intensive.

Training: Future Courses

CIBC Short Course in Boston
May, 2017
Training: CIBC Seminars

Over 40 Seminars this year

Paris Perdikaris, Postdoctoral Fellow, MIT Presents:
Data-driven probabilistic modeling and high-performance computing: algorithms and applications to physical and biological systems

Amanda Randles, Assistant Professor of Biomedical Engineering Presents:
Massively Parallel Models of Hemodynamics in the Human Vasculature

Susan Holmes, The John Henry Samter University Fellow In Undergraduate Education And Professor of Statistics, Stanford Medicine Presents:
Applying the principles of good registration to the visualization of uncertainty

Training: Impact Since 2010

Postdoctoral Fellows:

- Jeroen Sinstra – NVIDIA
- Josh Levine – Assistant Professor of Computing Science, University of Arizona
- Erik Anderson – Research Scientist, EGI
- Paul Rosen – Assistant Professor of Computer Science, USF
- Yaniv Gur – IBM Research
- Brad Hollister – Lecturer at CalPoly
- Moritz Dannauer – Postdoctoral Fellow
- Shireen Elhabian – Research Scientist
- Shankar Sastry – Postdoctoral Fellow

Graduated MS/PhD Students:

- Kedar Aras – Postdoc at George Washington U.
- Josh Blauer – Medtronic
- Jonathan Bronson – Google
- Josh Cates – Research Scientist CARMA and SCI Institute, Director of the BIDAC Core
- Jaume Coll Font – Postdoc at NEU
- Burak Erem – Postdoc, Boston Children’s Hospital
- Sarah Geneser – Medical Physics Resident, UCSF
- Seyhmus Guller – Postdoc at NEU
- Zhisong Fu – SYSTAP, LLC
- Karli Gilette – PhD student in Graz, Austria (CARP)
- Greg Gardner – Medical School
- Fangxiang Jiao – Senior Research Scientist, VA, University of Utah
- Sila Kurugol – Postdoc, BWH, then Postdoc, Boston Children’s Hospital
- Darrell Swenson – Medtronic
- Gopal Veni – IBM
- Dafang Wang – Assistant Research Scientist, Johns Hopkins University
Training: Current

Postdoctoral Fellows:
- Tushar Athawale (SCI)
- Jaume Coll Font (NU)
- Moritz Dannauer (SCI/NU)
- Jamshid Sourati (NU)
- Yong Wang (SCI)

Current Undergraduate Students:
- Max Hansen
- Rebecca Pennock
- Thomas Robertson
- Spencer Frisby
- Benjamin Larson
- Collin Tate
- Joe Massey

Graduate Students:
- Riddhish Bhalodia – Ph.D. student at SCI
- Shridharan Chandramouli – Ph.D. student at SCI
- Jessie France – Ph.D. student at SCI
- Alex Gerber – BS/MS student at SCI
- Kara Johnson – Ph.D. student at SCI
- Fernando Quivira - PhD student at NU
- Magdalena Schwarzl – M.S. student at SCI
- Kimia Shayestehfarid - PhD student at NU
- Jess Tate - Ph.D. student at SCI
- Maddalena Valinoti - Visiting student Technical University of Bologna, Italy
- Alexandra Warner – M.S. Student at SCI

Current Undergraduate Students:
- Max Hansen
- Rebecca Pennock
- Thomas Robertson
- Spencer Frisby
- Benjamin Larson
- Collin Tate
- Joe Massey

Recent Completed Trainees:
- Seyhmus Guler, PhD, post doc at NEU
- Andrew Miller - graduated with BS
- Minna Wang - junior BME Student
- Ahrash Poursaid - graduating 2015
- Kenneth Louie - junior BME student
- Biel Roig i Solvas - PhD student at NU
- Delia Fernandez Canellas - PhD student at UPC in Barcelona
- Paula Gonzalez Navarro - PhD at NU
- Angels Rates Borras - PhD at NU
- Spencer Frisby - graduated with BS
- Anterpreet Kaur - Intern at Bard
- Ahrash Poursaid - graduated with BS/MS
- Minna Wang - graduated with BS

Training: Extending through Users

Dear Mr./Mrs,

I’ve been trying Seg 3D for a few time and I liked so far. However, I’m working with big data sets and that has been an inconvenient. First I thought that was because of the size of the files (32 bits TIFF in total 10 - 20 GB), then I compressed the slices and even so the problem continues.... after a while I discovered that was a matter of the number of files and not so much because of the size of these.

Somehow I managed to load about 1300 slices in PNG format (a single CT scan) but when I want to apply a filter the program crashes again.

I can tell you that is not a problem of hardware requirements, we have a workstation in my University (University of münster, Germany) with a very good graphic cards (Geforce GTX Titan X) and 512GB of RAM.

Any comment would be greatly appreciated,

Best wishes.

Yeisson

Jan 31, 2017
3:27 AM

Jan 31, 2017
6:21 AM

Our lab routinely uses 500GB files and larger in Seg3D with no problems. Here are two tips for using your files:

1. Convert your files into a tiff stack, rather than loading individual files. Many freely available software options can be used for this, such as ImageJ or Imagemagick.
2. In the bin folder of your Seg3D installation, you will find a "CreateLargeVolume" executable. If applied to your data, it will create a pyramid tiff structure that will allow you to load in extremely large volume data.

If you have any questions on how to implement either of these, please feel free to contact me.

Best wishes,

Paul Holcomb
Dissemination

Dissemination: Specific Aims

• We will continue to modernize and update the Center website... ...Additionally, we will participate in and support community websites such as the BTRR portal and NITRC... ...Additionally, the Center will continue to use additional “channels” such as YouTube, vimeo, etc...

• We plan to extend interactive access to Center software distributions by transitioning our code to a repository platform that is more flexible in its ability to interact with outside collaborators and users.

• We propose to continue use of CIBC and CIBC-enabled publications as a means of dissemination of Center research.

• We will continue to use scientific conferences as a dissemination channel to promote Center research and software products.

• Training events such as on-site and off-site workshops and tutorials are an important part of the Training Component of the Center. As the Dissemination Component, we propose to disseminate recorded versions of events...
**Dissemination: CIBC Publications**

24 Total

*J Neural Eng.* 2016 Jun;13(3)

Optimization of focality and direction in dense electrode array transcranial direct current stimulation (tDCS).

Guler S¹, Dannhauer M, Erem B, Macleod R, Tucker D, Turovets S, Luu P, Erdogmus D, Brooks DH.


Quantitative comparison of cortical bone thickness using correspondence-based shape modeling in patients with cam femoroacetabular impingement.

Atkins PR, Elhabian SY, Agrawal P, Harris MD, Whitaker RT, Weiss JA, Peters CL, Anderson AE.

**Dissemination: Software Results**

Software Downloads > 192K

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**Dissemination: Software Publications**

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**Dissemination: Consortium Data**

CONSORTIUM FOR ECG IMAGING (CEI)

http://www.ecg-imaging.org
Administration

Administration: Personnel

We have a highly effective, experienced team!