Jesse Knight

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Education

MASc, Engineering Systems & Computing — Sept 2015 – May 2017
Dr. April Khademi PEng, Image Analysis in Medicine Lab, University of Guelph
Thesis Project: Development and application of a robust FLAIR MRI segmentation algorithm for multi-institutional, multi-disease analysis of white matter lesions, GPA: 95.0

BEng, Biomedical — Sept 2011 – May 2015
School of Engineering, University of Guelph
Foci: signal processing, medical imaging, MATLAB, interdisciplinary design, GPA: 93.7

Honours and Awards

Scholarships

OGS MASc — Sept 2016
NSERC CGS MASc — Sept 2015

Awards

Engineering Peer Helper of the Year Award — May 2016, 2015
Peer Helper Program Academic Award of Achievment — May 2016
E.B. MacNaughton Convocation Medal — July 2015
Awarded to the College of Physical and Engineering Science's nominee for the W.C. Winegard Medal, the most prestigious graduating award at the University of Guelph
Association of the Processional Engineers Medal — July 2015
College of Physical and Engineering Science Society of Excellence — July 2015
Helen Grade Tucker Design Award — July 2015
Dean's Scholarship — May 2015
Dean's Scholarship — May 2014
Dean's Scholarship — May 2013

Professional Experience

Graduate Teaching Assistant
School of Engineering, University of Guelph
- Lead weekly tutorials for 10 – 45 students, including lecture style and group problem solving sessions
- Rewrote course lab manuals, and independently developed problem sets and solution packages
- Revised assignment definitions, graded reports and examinations

Courses

ENGG 4040 Medical Imaging Modalities — Fall 2015
ENGG 4060 Biomedical Signal Processing — Winter 2016
ENGG 4660 Medical Image Processing — Winter 2016

Research Assistant: Richard I Aviv, MD — May 2014 – Aug 2014, May 2015

Department of Neuroradiology, Sunnybrook Health Sciences Centre

- We used statistical parametric mapping to quantify spatial impacts of collateral circulation on stroke outcome
- Collaborated with researchers, post-docs, and clinicians to develop user interfaces and scripts for batched image processing: coregistration to a common brainspace, controlateral ROI mirroring, and segmentation clean-up

Research Assistant: Herman J Eberl, PhD — May 2013 – Aug 2013

Biophysics Interdepartmental Group, University of Guelph

- Assisted the development of a computational model of the human anaerobic colon using bacterial groups
- Analyzed numerical solution methods for the hyperbolic partial differential equation model

Publications

Journal Publications

E. M. Fanou, J. Knight, R. I. Aviv, S.-P. Hojjat, S. P. Symons, L. Zhang, and M. Wintermark, "Effect of Collaterals on Clinical Presentation, Baseline Imaging, Complications, and Outcome in Acute Stroke.," AJNR. Am. J. Neuroradiol., vol. 36, no. 12, pp. 2285–91, Dec. 2015.

D. Huynh, M. W. Parsons, M. Wintermark, A. Vagal, C. D. d'Esterre, R. Vitorino, D. Efkehari, J. Knight, T. Huynh, A. Bivard, R. Swartz, S. Symons, and R. Aviv, "Can CT Perfusion accurately assess infarct core?," Neurovascular Imaging, vol. TBD, no. TBD, p. TBD, 2016.

Conference Proceedings

J. Knight, A. R. Moody, and A. Khademi, "Noise in parallel MRI: how to determine whether single-coil assumptions still hold (they don't) (Poster)," in Imaging Network Ontario Symposium, 2016.

Works in Progress & Under Review

J. Knight and A. Khademi, "Disease-Inspired Feature Design for Computer-Aided Diagnosis of Breast Cancer Digital Pathology Images," in Medical Image Analysis and Informatics: Computer-aided Diagnosis and Therapy 2, CRC Press, p. TBD.

B. Reiche, J. Knight, A. R. Moody, and A. Khademi, "Segmentation and Characterization of WML in FLAIR MRI," in Medical Image Analysis and Informatics: Computer-aided Diagnosis and Therapy 2, CRC Press, p. TDB.

J. Knight, D. Huynh, D. Efkehari, R. Vitorino, C. D. D'Esterre, D. Gladstone, S. Symons, and R. Aviv, "Topographic mapping of collateral impacts in acute ischemic stroke: effect of occlusion location and recanalization status," Am. J. Neuroradiol., vol. TBD, no. TBD, p. TBD.

Reviewer Work

Canadian Journal of Electrical and Computer Engineering, Associate Reviewer (1 review).

Canadian Conference of Elecetrical and Computer Engineering, Associate Reviewer (2 reviews).

Presentations

Medical Equipment Design for the Developing World — Jan 2016, Jan 2015

University of Guelph

Kibuye District Hospital Observations — July 2015

Summer Institute Rwanda Conference, Engineering World Health

Summer Research Project Competition — July 2014

Sunnybrook Research Institute

Extracurricular and Volunteer Work

Engineering Peer Helper — Aug 2013 – Present

University of Guelph

- Facilitated course-specific problem solving sessions and exam reviews for one to 200 students
- Developed a scheduling and booking system using Google Calendar for Peer Helper sessions, based on student class schedules, course due dates, and peer availability
- Independently organized How-To sessions for MS Word, Excel, and MATLAB

Bike Centre Volunteer — Sept 2013 – Present

Campus Bike Centre, University of Guelph

- Managed LGBTQ-friendly the drop-in DIY bike repair shop with other volunteers for up to 10 users at a time
- Rebuilt donated bikes for auction; helped prioritize parts purchasing for the shop

Co-President — Jan 2015 – Present

Engineering World Health Guelph

- Encouraged undergrad design groups to focus on medical equipment for the developing world
- Facilitated submissions to the EWH annual Design Competition
- Currently organizing a Dinner & Speakers style evening event on the topic of development and medicine

Summer Institute Rwanda — June 2015 – July 2015

Engineering World Health

- Worked with local biomedical engineering technicians at Kibuye Hospital to repair medical equipment
- Educated local nurses and physicians on proper usage and maintenance of equipment
- Developed fluent French and basic Kinyarwanda

Novice Men's Rowing — Sept 2014 – April 2015

University of Guelph

- 05:30 – 08:00 practice Mon to Fri September through October; regattas on Saturdays
- 06:30 – 08:30 practice Mon to Fri during winter training: strength and conditioning

Undergraduate Design Projects

Overview

- Three months; groups of 3 – 4
- Deliverables: Project Proposal, Interim Report, Final Report, and Presentation, Prototype†
- Aspects: literature review, constraint and criteria definition, performance and economic analysis.

Adaptive Directional Acoustic Filter†	Jan 2015 – Mar 2015
CT Perfusion Lesion Segmentation Algorithm†	Jan 2015 – Mar 2015
SIDS Prevention Biosensor†	Sept 2014 – Nov 2014
Stroke Rehabilitation Support Glove†	Sept 2014 – Nov 2014
Fetal Doppler Monitor Phantom	Jan 2014 – Mar 2014
Batmobile Kinder Egg Wind-Up Toy†	Jan 2013 – Mar 2013

Interests

In my spare time I enjoy cycling, discussing politics and philosophy with friends, reading, and writing MATLAB code (for fun).