

Jesse Knight

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SKILLS

Technical: Python/Theano, Git, MATLAB, SharcNet, HTML/CSS; basic C, Docker

Tools: LaTeX, Mendeley, Slack, Foundation

EXPERIENCE

MASc Thesis, Guelph School of Engineering Jan 2016 – Present

Project: White Matter Lesion Segmentation in brain MRI

- Improved generalization of an existing edge-based method through adaptive hyperparameters
- Placed 4/15th in international MS lesion segmentation challenge (MICCAI MSSEG 2016)
- Currently embedding a logistic regression model within a full-brain segmentation pipeline

Teaching Assistant, Guelph School of Engineering Sept 2015 – Present

Courses: Five 3rd and 4th courses in signal and medical image processing

- Lead weekly labs for 5 to 50 students; gave 2 full lectures during professor absences
- Independently developed lab manuals, problem sets, and solutions; managed course websites

Research Assistant, Dept. Neuroradiology, Sunnybrook Health Sciences Centre May – Aug 2014

Project: Impact of Collateral Circulation in Acute Ischemic Stroke

- Used parametric mapping to depict the impacts of collateral circulation on brain tissue survival
- Worked with clinicians to develop user interfaces for exploratory data analysis and image processing

EDUCATION

MASc, Computing, University of Guelph Sept 2015 – May 2017

Thesis: White matter lesion segmentation using FLAIR MRI | GPA: 94

Additional course projects:

- Estimation and Correction of Bias Field in Brain MRI (Nov 2016)
- A Convolutional Neural Network to Assess Malignancy in Breast Cancer Histology (Nov 2015)

BEng, BioMedical, University of Guelph Sept 2011 – May 2015

Foci: medical image analysis, signal processing | GPA: 94

Selected design projects:

- CT Perfusion Lesion Segmentation (Mar 2015)
- Adaptive Directional Acoustics Filter (Jan – Mar 2015)
- Fetal Doppler Monitor Phantom (Jan – Mar 2014)

AWARDS

Research Grants:

Ontario Graduate Scholarship – Master's Sept 2016 – Aug 2017

Canadian Graduate Scholarship – Master's (NSERC) Sept 2015 – Aug 2016

Awards

Dean's Scholarship (top student in program) May 2016, 2015, 2014, 2013, 2012

Engineering Peer Helper of the Year May 2016, 2015

E.B. MacNaughton Convocation Medal July 2015

Association of the Professional Engineers Medal July 2015

College of Physical and Engineering Science Society of Excellence July 2015

Helen Grace Tucker Design Award July 2015

Valedictorian, Mayfield S.S. July 2011

GRE Scores

170/170 Math (97th percentile), 164/170 Verbal (94th percentile), 4.5/6 Writing (82nd percentile) Aug 2016

PUBLICATIONS

Accepted and in Print

- 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, (in print).
- 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, (in print).

Conferences

- J Knight, and A Khademi, "MS Lesion Segmentation Using FLAIR MRI Only" in MSSeg Challenge at Medical Image Computing and Computer-Assisted Intervention – MICCAI. 2016.
- 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 – ImNO. 2016.

Journal Publications

- D C Huynh, M W Parsons, M Wintermark, A Vagal, C D D'Esterre, R Vitorino, D Efkehari, J Knight, T J Huynh, A Bivard, R Swartz, S Symons, and R I Aviv, "Can CT perfusion accurately assess infarct core?". Neurovascular Imaging. 2(7), 1-7. 2016.
- E M Fanou, J Knight, R I Aviv, S Hojjat, S P Symons, L Zhang, and M Wintermark, "Effect of Collaterals on Clinical Presentation, Baseline Imaging, Complications, and Outcome in Acute Stroke". AJNR. American journal of neuroradiology. 36(12), 2285-91. 2015.

Reviewer Work

- Canadian Journal of Electrical and Computer Engineering – CJECE (2 reviews)
- Canadian Conference of Electrical and Computer Engineering – CCECE (2 reviews)

EXTRACURRICULARS AND VOLUNTEERING

Engineering Peer Helper, University of Guelph Aug 2013 – Present

- Planned over 50 group problem-solving sessions and exam reviews for 1 to 200+ students
- Lead a transition to online session booking using Google Calendar in lieu of static weekly slots

Web Development Sept 2015 – Present

- Self-taught: HTML, CSS, JSON, and more python
- Developed python objects for template-based website creation; like 'Genshi', before I discovered it
- Built a Chrome extension similar to 'Google search tab fixer', before I found that too

Summer Institute, Rwanda, Engineering World Health June – July 2015

- Worked with local engineering technicians at Kibuye Hospital to repair medical equipment
- Developed an online maintenance management module for better tracking and remote requests

Bike Centre Volunteer, CSA Bike Centre, University of Guelph Aug 2014 – Present

Novice Men's Rowing, University of Guelph Sept 2014 – April 2015