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 model through adaptive hyperparameters
- Placed 4/15th in international MS lesion segmentation challenge (MICCAI MSSeg 2016)
- Currently embedding probabilistic lesion segmentation 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
- Correlated results with cerebral vascular territories

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