42 Parkview Place
Brampton ON Canada L6W2G4
☎ 226.821.2066
✉ jesse.x.knight@gmail.com
jessexknight
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Jesse Knight

Skills

- Data science: Python, MATLAB, Linux
- Web dev: HTML, CSS, JavaScript, PHP, SQL
- Development tools: Github, Docker
- Literature review and technical writing
- Experiment design and analysis
- Customer service and teaching

Education

2015-09–2017-12 **MASc, Engineering Systems & Computing**, *University of Guelph*, GPA: 92.7.
Project: Voxel-Wise Image Analysis for White Matter Hyperintensity Segmentation

2011-09–2015-05 **BEng, Biomedical Engineering**, *University of Guelph*, GPA: 93.7.
Foci: medical image and signal processing, computational modelling, engineering design

Related Experience

Selected Web Projects (linked).

- EWH Repairs Database – an online dashboard of medical equipment field repairs
- BibTable – a Python tool for producing HTML/JS and LaTeX tables from .bib files
- WMH Papers Table – an interactive HTML/JS table using papers from my MASc thesis
- Volshow – a customizable 3D multi-image viewer in MATLAB with mouse scrolling
- Kickbike Ontario – a small business website with integrated PayPal buy buttons

2015-09–2017-12 **MASc Thesis**, *Guelph School of Engineering*.

- Designed automated experiments for segmentation algorithm component testing
- Improved estimation of algorithm performance through a new cross-validation framework
- Presented results at local lab meetings and international conferences

2015-09–2017-12 **Teaching Assistant**, *Guelph School of Engineering*, 7 courses (3rd–4th year).

- Lead weekly tutorials for 15–80 students, and three 90-min lectures during professor absence
- Independently rewrote course lab manuals and problem sets in response to student needs
- Provided detailed feedback on over 400 student lab reports
- Helped debug student code (C, MATLAB) one-on-one, in groups, and by email

2015-06–2015-07 **Biomedical Engineering Technician**, *Engineering World Health*, Rwanda.

- Worked with local engineering technicians at Kibuye Hospital to repair medical equipment
- Developed an online maintenance app for remote requests and monthly reporting
- Identified design project ideas for 3rd year engineering teams upon return

2014-05–2014-08 **Research Assistant**, *Dr. Aviv, Dept. Medical Imaging, Sunnybrook Research Institute*.
Project: *Localizing the impact of collateral circulation in acute ischemic stroke*

- Quantified the impact of treatment and vascular involvement on stroke lesion volume
- Constructed parametric image analysis pipelines from existing and custom software
- Collaborated with clinicians to develop user interfaces (UI) and scripts for data analysis tasks

2013-05–2013-08 **Research Assistant**, *Dr. Eberl, Biophysics Interdept. Group, University of Guelph*.
Project: *A mass-balance model of the human anaerobic colon*

- Validated code implementation of the hyperbolic partial differential equation model
- Designed experiments to quantify the impact of numerical methods on model output

Awards & Scholarships

Research Scholarships

2016-09–2017-08 $15,000 – OGS–M for: White Matter Lesion Segmentation in MRI

2015-09–2016-08 $17,500 – CGS–M (NSERC) for: White Matter Lesion Segmentation in MRI

2014-05–2014-08 $7,000 – Hurvitz Brain Sciences Summer Student, Sunnybrook Research Institute

2013-05–2013-08 $7,000 – Undergrad Student Research Award, U of G

Awards

2017 Engineering Teaching Assistant of the Year

2012 – 2017 Dean's Scholarship

2016, 2017 Engineering Peer Helper of the Year

2015 College of Physical and Engineering Sciences Nominee for W.C. Winegard Medal

University of Guelph top convocation award to an undergraduate student

2015 Helen Grace Tucker Design Award

2015 Association of the Professional Engineers Medal

2015 College of Physical and Engineering Science Society of Excellence

Volunteering & Extracurriculars

2017-01–2017-03 **Faculty Hiring Committee**, *Guelph School of Engineering.*

2014-08–2017-04 **Bike Centre Volunteer**, *CSA Bike Center, University of Guelph.*

2014-01–2015-04 **Treasurer**, *Engineering World Health, University of Guelph.*

2014-09–2015-04 **Novice Men's Rowing Crew**, *University of Guelph.*

2012-09–2012-12 **Bookshelf Tutor**, *University of Guelph.*

Publications

Articles

Knight, J. Khademi, A. Taylor, G. (under revision). "Voxel-Wise Logistic Regression and Leave-One-Scanner-Out Cross Validation for White Matter Hyperintensity Segmentation". In: *NeuroImage.*

Knight, J. Taylor, G. W. Khademi, A. (2017). "Equivalence of histogram equalization, histogram matching and the Nyul algorithm for intensity standardization in MRI". In: *Journal of Computational Vision and Imaging Systems* 3.1.

Huynh, D. C. Parsons, M. W. Wintermark, M. Vagal, A. D'Esterre, C. D. Vitorino, R. Efkehari, D. **Knight, J.** Huynh, T. J. Bivard, A. Swartz, R. Symons, S. Aviv, R. I. (2016). "Can CT perfusion accurately assess infarct core?" In: *Neurovascular Imaging* 2.7, pp. 1–7.

Fanou, E. M. **Knight, J.** Aviv, R. I. Hojjat, S.-P. Symons, S. P. Zhang, L, Wintermark, M, (2015). "Effect of Collaterals on Clinical Presentation, Baseline Imaging, Complications, and Outcome in Acute Stroke". In: *AJNR. American journal of neuroradiology* 36.12, pp. 2285–91.

Conferences

Knight, J. Khademi, A. (2016). "MS Lesion Segmentation Using FLAIR MRI Only". In: *MSSEG Challenge Proceedings: Multiple Sclerosis Lesions Segmentation Challenge Using a Data Management and Processing Infrastructure.* Athens, Greece, p. 21.

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

Book Chapters

Knight, J. Khademi, A. (2017). "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.* Ed. by Paulo Mazzoncini de Azevedo Marques, Arianna Mencattini, Marcello Salmeri, and Rangaraj M Rangayyan. CRC Press.

Reiche, B. **Knight, J.** Moody, A. R. Khademi, A. (2017). "Segmentation and Characterization of WML in FLAIR MRI". In: *Medical Image Analysis and Informatics: Computer-aided Diagnosis and Therapy 2.* Ed. by Paulo Mazzoncini de Azevedo Marques, Arianna Mencattini, Marcello Salmeri, and Rangaraj M Rangayyan. CRC Press.

Thesis

Knight, J. (2017). "Voxel-Wise Image Analysis for White Matter Hyperintensity Segmentation". Master of Applied Science. University of Guelph.