

Raphaël J. L. Townshend

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EDUCATION

Stanford University

Ph.D. in Computer Science (Artificial Intelligence)

Fall 2014 – Present

GPA: 4.00/4.00

University of California, Berkeley

B.S. in Electrical Engineering and Computer Science (High Distinction)

Fall 2010 – Spring 2014

GPA: 3.90/4.00

Coursework: Abstract Algebra, Algorithms, Artificial Intelligence, Combinatorial Algorithms, Compilers, Computational Biology in Four Dimensions, Computational Structural Biology, Computer Vision, Databases, Graphical Models, Linear Algebra, Machine Learning, Natural Language Processing, Operating Systems, Statistical Learning Methods for Genomics, Statistical Learning Theory, User Interfaces, Visual Object and Activity Recognition

AREAS OF INTEREST

Machine Learning, Structural Biology, Computer Vision

PUBLICATIONS

- R.J.L. Townshend, R. Bedi, and R.O. Dror. **Transferrable End-to-End Learning for Protein Interface Prediction.** NeurIPS 2018 Workshop on Machine Learning for Molecules and Materials. Montreal, Canada, December 2018.
- N.R. Latorraca, J.K. Wang, B. Bauer, R.J.L. Townshend, S.A. Hollingsworth, J.E. Olivieri, H.E. Xu, M.E. Sommer, and R.O. Dror. **Molecular mechanism of GPCR-mediated arrestin activation.** Nature 557:452-456 (2018).
- E. Tzeng, A. Zhai, M. Clements, R. Townshend, and A. Zakhor, “**User-Driven Geolocation of Untagged Desert Imagery Using Digital Elevation Models,**” CVPR 2013 Workshop on Visual Analysis and Geo-Localization of Large-Scale Imagery. Portland, Oregon, June 2013.

HONORS AND AWARDS

- Best in Show and People’s Choice Science Hack Day San Francisco, Sept 2015
- National Science Foundation Fellowship, Apr 2015
- Stanford School of Engineering Graduate Fellowship, Sept 2014
- Berkeley’s ACM International Collegiate Programming Contest team, Oct 2013
- Best in Show at Science Hack Day San Francisco, Sept 2013
- EECS Honors Degree Program with concentration in Statistical Learning, Mar 2013
- Matrix Multiplication Optimization Competition runner-up, Dec 2012
- Elected to “Eta Kappa Nu” Undergraduate Honors Society, Dec 2011
- Maker Faire Young Inventor, May 2010

BIOGRAPHICAL

- Citizenship: *Canadian, U.S. Permanent Resident*
- Date of Birth: January 22, 1993
- Place of Birth: Montreal, Canada
- Languages Spoken: native English, native French

EMPLOYMENT AND EXPERIENCE

Stanford University: Computer Science Department

Stanford, CA

Head Teaching Assistant (CS299: Machine Learning)

September 2018 – Present

- One of largest courses at Stanford, with over 750 enrolled students
- Coordinating team of 30 Teaching Assistants
- Designed and gave new lecture on Decision Trees and Ensembling Methods

Stanford University: Stanford Artificial Intelligence Laboratory

Stanford, CA

National Science Foundation Fellow (PI: Professor Ron Dror)

September 2014 – Present

- Designing Machine Learning methods for application to atomic systems
- Leading and mentoring inter-disciplinary team of students
- Specifically, we are investigating new representations and applications for atomic data

Scaled Inference

Palo Alto, CA

Inference Intern

June 2015 – September 2015

- Researched, designed, and implemented Bayesian models for core modeling pipeline

Google

Mountain View, CA

Software Engineering Intern

June 2014 – September 2014

- Worked on the Image Search team, exploiting structured data on the web
- Brainstormed and implemented novel ways of leveraging webpage annotations

University of California, Berkeley: Video and Image Processing Lab

Berkeley, CA

Undergraduate Research Assistant (PI: Professor Avideh Zakhor)

May 2012 – June 2014

- Developed Computer Vision techniques for large scale geo-localization
- Worked directly with Prof. Zakhor
- Designed and implemented a synthetic horizon matcher using digital elevation models
- Funded as part of the Intelligence Advanced Research Projects Activity (IARPA) Finder Program

Open Computing Facility

Berkeley, CA

Root Staff Member / Director

August 2011 – June 2014

- Volunteered as a high-level administrator for computing facility with over 7,000 student users
- As a director, partook in all major technical and administrative decisions concerning the OCF

University of California, Berkeley: Berkeley Carillon Guild

Berkeley, CA

Student Carillonist / Instructor

May 2010 – June 2014

- Performed weekly recitals on the Sather Tower carillon
- Taught a course on playing the carillon to a dozen undergraduates

University of California, Berkeley: Computer Science Department

Berkeley, CA

Undergraduate Student Instructor

June 2012 – August 2012

- Taught Machine Structures course to section and lab of 30 undergraduates
- Redesigned and improved matrix multiplication optimization and parallelization project
- Guest lectured on MapReduce and Warehouse Scale Computing to class of 100

University of California, Berkeley: Berkeley Orders Of Magnitude

Berkeley, CA

Undergraduate Research Assistant (PI: Professor Joseph Hellerstein)

January 2012 – May 2012

- Developed algorithms within a new “disorderly” distributed computing framework
- Met regularly with graduate research team

Hewlett-Packard

Sunnyvale, CA

Graphics Intern

May 2011 – August 2011

- Implemented performance improvements within the WebOS graphics engine
- Helped write cross-platform, multi-core capabilities for the engine