

# Carl N. Edwards

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## Education

### University of Tennessee-Knoxville

Honors Computer Science BS  
Honors Math Double Major  
STEM GPA: 4.0/4.0  
Chancellor's Honors Program  
Mathematics Honors Program

Expected Graduation May 2020

Overall GPA: 3.99/4.0

Engineering Honors Program

### University of Zürich:

EuroScholars Research Study Abroad

Fall Semester 2018

[Dynamic and Distributed Information Systems Group](#)

Project: Linking Knowledge Graphs and Images Using Embeddings

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- Crafted two linked datasets between knowledge graphs and image datasets.
  - Incorporation of embedding models based on InceptionNet and TransE into a joint embedding model.
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## Relevant Coursework

- Introduction to Pattern Recognition
- Biologically Inspired Computation
- Independent Study: Machine Learning
- Reinforcement Learning (G) (Fall 2019)
- Deep Learning (G) (Registered for Spring 2020)
- Probability and Random Variables

(G) – Indicates graduate level course

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## Past Experience

**Robotics Institute Summer Scholar (NSF REU)**–[Auton Lab](#) Carnegie Mellon University Summer 2019

- Detected emerging trends in multimodal human trafficking dataset consisting of over 40 million data points.
- Integrated multiple similarity measures using face detection, unsupervised word embeddings, and regex-extracted features in order to detect organizations in tens of millions of escort advertisements scraped from online sources.

**ORNL – DOE SULI Internship** – [CISR](#) Oak Ridge National Laboratory Summer 2018

- Researched global optimization algorithms for subarrayed phase-only radar beam synthesis.
- Created deliverables including report, poster, presentation, and IEEE format journal article draft.

**Undergraduate Research Assistant** – [MRAIL](#) University of Tennessee, Knoxville Fall 2016- Spring 2018

- Performed Brownian dynamics simulations of flowing polymer solutions.
- Created visualizations from resulting data and computed solution physical properties.
- Prepared manuscript for publication in J. Mol. Graph. Model.

**ORNL – HERE Internship** – [CISR](#) Oak Ridge National Laboratory Summer 2017

- Developed radar simulations using proprietary technology.
- Designed phased array radar beam width optimization algorithms (GA, particle swarm, simulated annealing).

**Software Engineering Intern** [Nanomechanics, Inc.](#) Oak Ridge, TN. Summer 2016

- Programmed proprietary software to interpret high speed data using C++ .
  - Developed programs for Linux, Raspberry Pi, and ALSA libraries.
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## Activities and Skills

- **Programming:** Proficient in C++, Matlab, Python (2.7 and 3), and Java; Experience with C, Fortran, LaTeX, HTML, and CSS. Experienced with Windows and Linux.

- **Skills:** Embeddings (image, knowledge graph, word, document, etc), keras, tensorflow, pytorch, pandas, knowledge graphs, multimodal data, computer vision, face recognition, NLP, global optimization, trend detection, deep learning, multitask learning, reinforcement learning, scientific computing, statistical decision theory, Bayesian learning
  - **UTK Machine Learning Club:** Fall 2017-present, member of Executive Board
  - **HackUTK:** 2016-present, UTK cybersecurity organization, VolHacks Hackathon 2016, 2017, 2019
  - **Taekwondo:** 2007-2016, Korean martial art, black belt
  - **Classical Singing:** 2015-present
  - **FIRST Robotics:** 2011-2016  
**Senior year:** programming leader and team coleader; participated in playoffs at Smoky Mountain Regional  
**Junior year:** co-programmer; Industrial design award, Georgia Southern Classic: 4<sup>th</sup>, Smoky Mountain: 5<sup>th</sup>
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## Honor Societies

- Tau Beta Pi
  - Phi Kappa Phi
  - Sigma Alpha Lambda
  - Pi Mu Epsilon
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## Awards

- **Goldwater Scholarship** (2019)
  - UTK Outstanding Computer Science Junior (2018) – awarded to a single junior in computer science based on academic merit
  - Min H. Kao Scholar (2018, 2019) – Roughly six students selected from EE, CS, and CE majors based on academic merit
  - Schmitt Memorial Scholarship (Math) (2019)
  - Thomas & Kathryn Shelton Award (2017, 2018, 2019)
  - Volunteer Scholarship (2016-2020)
  - UT Provost Scholarship (2016-2020)
  - Dean's List every semester (2016-2019)
  - State of Tennessee Governor's School for Computational Physics Attendee (2015)
  - National Merit Scholar (2016)
  - AP Scholar with Distinction (2016)
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## Journal Article

In-plane and out-of-plane rotational motion of individual chain molecules in steady shear flow of polymer melts and solutions, C.N. Edwards, M.H. Nafar Sefiddashti, B.J. Edwards, and B. Khomami, *J. Mol. Graph. Model.*, 81, 184-196 (2018).

Using Similarity Measures to Detect Organizations in Online Escort Advertisements, C. Edwards, A. Wertz, and A. Dubrawski, *Robotics Institute Summer Scholar' Working Papers Journal*, 7, 43-49 (2019).

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## Presentations

Out-of-plane rotational motion in shear flow of polymer melts and solutions, M.H. Nafar Sefiddashti, C.N. Edwards, B.J. Edwards, and B. Khomami, The Society of Rheology 89th Annual Meeting, Denver, CO, October 8-12, 2017.

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## Posters

Edwards C.N., Wertz A., Dubrawski A.W., Using Similarity Measures to Detect Organizations in Online Escort Advertisements. Poster presented at: RISS 2019 Poster Session; 2019 August 14; Pittsburgh, PA.

Edwards C.N., Daniel B., Beam Broadening of Subarrayed Radar Arrays Utilizing Various Global Optimization Techniques. Poster presented at: ORNL 2018 Undergraduate Research Poster Session; 2018 August 1; Oak Ridge, TN