Curriculum Vitae

David T. Radke

Educational History:

University of Waterloo Waterloo, Ontario Canada	PhD	Computer Science – Artificial Intelligence, Systems and Networking **Average: 94.6%**	2018- Current
Colorado College Colorado Springs, Colorado USA	B.A.	Major: Computer Science, Minor: Discrete Math **GPA: 3.55**	2015- 2018

Contact
- Email: dtradke@uwaterloo.ca
- Phone: +1 (925) 708-9516
- Website: https://cs.uwaterloo.ca/~dtradke/

Social
- LinkedIn: https://www.linkedin.com/in/david-radke/
- GitHub: https://github.com/Dtradke (Usually use private University of Waterloo Git)
- Waterloo Git: https://git.uwaterloo.ca/dtradke
- ResearchGate: https://www.researchgate.net/profile/David_Radke

Nationality
- United States
- Canada

Advisors
University of Waterloo:
- Kate Larson (klarson@uwaterloo.ca) – Artificial Intelligence
- Tim Brecht (brecht@cs.uwaterloo.ca) – Systems and Networking

Colorado College:
- Dan Ellsworth (dellsworth@coloradocollege.edu)

Professors with Research Collaborations
University of Waterloo:
- Mei Nagappan (mei.nagappan@uwaterloo.ca) – Software Engineering
- Robin Cohen (rcohen@uwaterloo.ca) – Artificial Intelligence

University of California, Los Angeles
- Omid Abari (omid@cs.ucla.edu) – Networked Systems (IoT)

University of California, Berkeley:
- John Radke (ratt@berkeley.edu) – Geographic Information Systems (GIS)

Key Words
- Artificial Intelligence
- Systems and Networking
- Internet of Things (IoT)
- Multiagent Systems
- Reinforcement Learning
- Game Theory

Technical Skills and Experience
- <u>Languages:</u> Python, Java, C, C++
- <u>Libraries and Software:</u> NumPy, Pandas, Tensorflow, Keras, PyTorch, Scikit-Learn, ArcGIS, Google Earth Engine
- <u>OS:</u> Linux, MacOS

Research and Professional Experience
08/2018 - Current

University of Waterloo, Ontario, Canada

Research and Teaching Assistant

> I spearhead and contribute to robust and dynamic research projects and prototype implementations in the AI and systems and networking communities. These projects have as their goal technological development and publication in top conferences and workshops. I also coordinate teaching assistants, and grade assignments and exams for undergraduate courses. My projects deal with intelligent agent interaction, time-series analysis, and applications of artificial intelligence problems to real-world problems.

Summer 2018

Lawrence Livermore National Laboratory, Livermore, CA

Research Intern - Computation

> Created the world's largest 3D boid simulation that ran across a large distributed system and implemented Message Passing Interface (MPI) in parallel. Leverages linear algebra to determine flight paths of millions of boids throughout simulation.

06/2017 – 06/2018

UC Berkeley, Berkeley, CA

Research Assistant

> Conducted research for the Center for Catastrophic Risk Management (CCRM) as part of a larger research team focused on the future impact of flooding and wildfire on the transportation fuel sector of California in a report for the California Energy Commission. I worked with Google Earth Engine and ArcGIS to process remotely sensed geographic data and build independent variables to be used for fire modeling. I also helped integrate the fire modeling software, Flammap, to with the ArcGIS environment, making it more available and easier for GIS researchers to implement.

Refereed Publications

Conference Papers

2020

> **D. Radke**, O. Abari, T. Brecht, K. Larson. Can Future Wireless Networks Detect Fires?. *International Conference on Systems for Energy-Efficient Built Environments (BuildSys-20)*, 2020.
> **(link: https://dl.acm.org/doi/10.1145/3408308.3427978)**
> **Acceptance Rate: 35.2%**

2019

> **D. Radke**, A. Hessler, D. Ellsworth. FireCast: Leveraging Deep Learning to Predict Wildfire Spread. *International Joint Conference on Artificial Intelligence (IJCAI-19)*, pp. 4575-4581, 2019.
> **(link: https://www.ijcai.org/proceedings/2019/0636.pdf)**
> **Acceptance Rate: 17.9%**

Journal Papers

2020

> **D. T. Radke**, D. L. Radke, J. D. Radke. Beyond Measurement: Extracting Vegetation Height from High Resolution Imagery with Deep Learning. *Remote Sensing*. 2020, *12(22)*, 3797.
> **DOI: https://doi.org/10.3390/rs12223797**
> **(link: https://www.mdpi.com/2072-4292/12/22/3797)**
> **Journal Impact Factor: 4.509**
> **5-Year Impact Factor: 5.001**

Workshop Papers

2021

> **D. T. Radke,** D. L. Radke, T. Brecht, A. Pawelczyk. Passing and Pressure Metrics in Ice Hockey. *Artificial Intelligence for Sports Analytics, International Joint Conference on Artificial Intelligence (AISA-IJCAI-21)*, 2021.

Other Publications

2018

> Radke, J. D., G. S. Biging, K. Roberts, M. Schmidt-Poolman, H. Foster, E. Roe, Y. Ju, S. Lindbergh, T. Beach, L. Maier, Y. He, M. Ashenfarb, P. Norton, M. Wray, A. Alruheil, S. Yi, R. Rau, J. Collins, **D. Radke**, M. Coufal, S. Marx, D. Moanga, V. Ulyashin, A. Dalal. (University Of California, Berkeley). 2018. Assessing Extreme Weather- Related Vulnerability And Identifying Resilience Options For California's Interdependent Transportation Fuel Sector. California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CCCA4-CEC-2018-012.

(link: https://www.energy.ca.gov/sites/default/files/2019-07/Energy_CCCA4-CEC-2018-012.pdf)

Working Papers

D. T. Radke, T. Brecht, R. Cohen, K. Larson, D. L. Radke. Finding Representative Agent Groups in Dynamic Environments.

PhD Dissertation – Proposed Topic
2018 – Current
"Multiagent Systems with Heterogeneous Population Structure in the Presence of Complex Social Dilemmas"

Undergraduate Senior Thesis
2017 – 2018
"Using Artificial Neural Networks to Predict Wildfire Growth"
- My senior thesis was inspired by the research project worked on at UC Berkeley during the summer of 2017. We created the first supervised learning software for wildfire spread prediction using artificial neural networks to learn from the activity of historical fires. Our model used a novel architecture which combined spatial and atmospheric data using a convolutional neural network and fully connected layers to determine areas of high risk surrounding an active wildfire perimeter. This approach has increased accuracy, recall, and F-score when compared to other widely used wildfire spread prediction software.
    This thesis was chosen as one of 60 projects out of over 400 to be presented to United States legislators on Capitol Hill. It was selected through the "Posters on the Hill" project.
    (*www.cur.org/conferences_and_events/student_events/posters_on_the_hill_2018*)

Presentations
Oral:
2020
"Can Future Wireless Network Detect Fires?" – BuildSys, Yokahama, Japan (Virtual)

2019
"FireCast: Leveraging Deep Learning to Predict Wildfire Spread" – IJCAI, Macao, Macao

2018

"Using Artificial Neural Networks to Predict Wildfire Spread" – Posters on the Hill, Washington D.C., USA

Poster:
2021

"Can Future Wireless Network Detect Fires?" – Vector Institute Deep Learning Research Symposium, Toronto, Ontario (Virtual) **AND** University of Guelph Machine Learning Research Group, Guelph, Ontario (Virtual)

2019

"FireCast: Leveraging Deep Learning to Predict Wildfire Spread" – IJCAI, Macao, Macao **AND** Evolution of Deep Learning Symposium, Toronto, Canada

2018

"Using Artificial Neural Networks to Predict Wildfire Spread" – Posters on the Hill, Washington D.C., USA

Awards and Acknowledgements

Type 1 Cheriton Scholarship	2021
Waterloo Artificial Intelligence Institute Scholarship	
Ron & Lydia Glover Award	
Math Domestic Graduate Award	
USports Academic All-Canadian	
UWaterloo Athletic Financial Award	
1st Place Sportsnet Hockey Hackathon: Powered by Rogers 5G	2020
Type 1 Cheriton Scholarship	
Cherrey Bus Lines Award	
Math Domestic Graduate Award	
Waterloo Warriors Community Service Award	
USports Academic All-Canadian	
UWaterloo Athletic Financial Award	
Math Domestic Graduate Award	2019
Math Domestic Graduate Scholarship	
HockeyTech Hockey Award	
Colorado College Thesis selected as a **"Top Undergraduate Research Project"** by Posters on the Hill	2018
National Collegiate Hockey Conference All-Academic Team	2017
National Collegiate Hockey Conference All-Academic Team	2016
Soo Thunderbirds Scholastic Player of the Year Award	2014
Soo Thunderbirds Scholastic Player of the Year Award	2013

Soo Thunderbirds Most Sportsmanlike Award

Courses Taken
Graduate   Area
CS 886: Trust Modeling and Social Networks   Artificial Intelligence
CS 886: Theory of Deep Learning   Artificial Intelligence
CS 854: Experimental Performance Evaluation   Systems and Networking
CS 854: Intelligent Connectivity – Internet of Things   Systems and Networking
CS 848: Machine Learning for Data Cleaning   Databases
CS 889: Information Visualization   Graphics and User Interfaces
CS 846: Software Engineering for Large Repositories   Software Engineering
CS 885: Reinforcement Learning   Computational Statistics

Undergraduate
Computer Science:
CSD 102: Programming in C++
CSD 105: Programming in Python
CP 122: Computer Science 1
CP 222: Computer Science 2
CP 275: Computer Organization
CP 274: Software Design
CP 334: Database Systems
CP 405: Theory of Computation
CP 407: Analysis of Algorithms
CP 341: Topics in Computer Science: Machine Learning
ESPM 298: Directed Group Study (Environmental Analysis – UC Berkeley Summer '17)

Mathematics:
MA 126: Calculus 1
MA 129: Calculus 2
MA 204: Calculus 3
MA 251: Number Theory
MA 201: Foundations of Discrete Mathematics
MA 220: Linear Algebra
MA 325: Graph Theory
MA 321: Abstract Algebra

More Details
USports Ice Hockey at the University of Waterloo
Division I Ice Hockey at Colorado College
Sailing on Lake Superior
Hiking