

Blake Ruprecht

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Columbia, MO, USA

SUMMARY

I am an effective altruist who has spent the past five years working on the AI alignment problem through direct research and study of eXplainable Artificial Intelligence (XAI). During that time, I honed my passion for learning, and developed a new one for written communication. I now seek roles where I can improve my research and communication skills.

EDUCATION

M.S. in Computer Science, *University of Missouri (Columbia, MO, USA)* 08/2019 - 05/2023

- GPA: 3.9/4.0 on full academic scholarship, plus research stipend
- Advisor: Dr. Derek Anderson
- Thesis: EXPLAINABLE PARTS-BASED CONCEPT MODELING AND REASONING

B.S. in Mechanical Engineering, *University of Missouri (Columbia, MO, USA)* 08/2015 - 05/2019

- GPA: 3.9/4.0 (Summa Cum Laude) on full academic scholarship

EXPERIENCE

Graduate Research Assistant, *Dr. Derek Anderson*, 08/2019 - 10/2022

- Learn independently about the field of explainable artificial intelligence, a potential solution to the AI alignment problem involving neural networks, evolutionary algorithms, fuzzy math, cognitive science, decision-making, reinforcement learning, linguistics, and game theory
- Develop new data-driven XAI algorithms using general coding skills based around Python, PyTorch, Bash, Git, Linux, and a bit of ROS, Matlab, NLTK, HTML/CSS, C++.
- Lead weekly research meetings and collaborate with multiple senior researchers using informal presentations to provide my input and receive feedback on research direction and next steps for our current paper
- Wrote technical research papers using high attention to detail to be factually accurate, cite all references, include equations and figures, and tell a cohesive story. Published five papers, failed on three, learned a lot from all.
- Presented technical talks in seminars and conferences with emphasis on clear and concise explanations

Undergraduate Researcher, *Dr. Derek Anderson*, 09/2018 - 07/2019

- Learn about explainable artificial intelligence, and program for the first time in a 4000 level course
- Implemented and tested new models versus existing neural networks using PyTorch, Python
- Determined if data fusion and/or a new mathematical model will improve neural networks

Orientation Leader, *University of Missouri*, 01/2017 - 07/2017

- Oriented 10,000 students, parents, and guests to the University during Summer Welcome
- Communicate complex ideas to large and small groups of parents and students
- Worked with a diverse team of leaders in an intense, 80+ hrs/week environment

ABOUT ME

Outside of writing and research, I care deeply about the environment, energy, and deep ecology. I spend a lot of time backpacking, hiking the PCT, camping on the L.A. beach, hammocking under the stars of the Rockies, float-tripping in rural Missouri, and hosteling in Southeast Asia and Europe. I've built most of my own furniture, and led groups building large wooden art installations. I love black ink drawing and practicing calligraphy. I cook lots of tacos, curry, and BBQ, and occasionally brew beer for final projects in school. I shoot well above par in disc golf.

PUBLICATIONS

Journal Articles

A. Cannaday, C. Davis, G. Scott, **B. Ruprecht**, and D. T. Anderson, "Broad Area Search and Detection of Surface-to-Air Missile Sites Using Spatial Fusion of Component Object Detections from Deep Neural Networks", IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 2020

Conference Articles

B. Young, D. T. Anderson, J. Keller, F. Petry, C. Michael and **B. Ruprecht**, "Human-Oriented Fuzzy Set Based Explanations of Spatial Concepts," WCCI 2023

B. Ruprecht, D. T. Anderson, F. Petry, J. M. Keller, C. Michael, A. Buck, G. Scott, C. Davis, "Concept Learning Based on Human Interaction and Explainable AI," SPIE 2021

B. Ruprecht, W. Wu, M. Islam, D. T. Anderson, J. Keller, G. Scott, C. Davis, F. Petry, P. Elmore, K. Nock, E. Gilmour, "Possibilistic Clustering Enabled Neuro Fuzzy Logic," WCCI 2020

B. Ruprecht, C. Veal, A. Cannaday, D. T. Anderson, F. Petry, J. Keller, G. Scott, C. Davis, C. Norsworthy, P. Elmore, K. Nock, E. Gilmour, "Neuro-fuzzy logic for parts-based reasoning about complex scenes in remotely sensed data", SPIE 2020

Poster Presentations

B. Ruprecht, C. Veal, B. Murray, M.A. Islam, D.T. Anderson, F. Petry, J. Keller, G. Scott, and C. Davis, "Fuzzy Logic-Based Fusion of Deep Learners in Remote Sensing," FuzzIEEE 2019.