BRYON TJANAKA

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RESEARCH INTERESTS

Robotics, (Hierarchical) Reinforcement/Imitation Learning, Clustering, Human-Robot Collaboration, Algorithms

EDUCATION

B.S. Computer Science (AI specialization) • ICS Honors Program — Sept. 2017 - Jun. 2020
University of California, Irvine

High School — Aug. 2013 - May 2017
Bellarmine College Preparatory (San Jose, California, USA)

HONORS AND AWARDS

UCI Dean's Honor List — Sept. 2017 - Present
UCI Regents' Scholarship — Sept. 2017 - Present
UCI UROP Fellowship for *Improving Molecular Simulations* — Jan. 2020
UCI UROP Fellowship for *Improving Molecular Simulations* — Jan. 2019
UCI UROP Honorary Fellowship for *Implications of Mall Security Robots* — Jan. 2018
7^{th}/88 at ACM ICPC 2019 SoCal Regional — Nov. 2019
9^{th}/98 at ACM ICPC 2018 SoCal Regional — Nov. 2018
16^{th}/105 at ACM ICPC 2017 SoCal Regional — Nov. 2017
39^{th}/4103 in world, 4^{th}/202 in US at IEEExtreme 13.0 — Oct. 2019
74^{th}/4049 in world, 7^{th}/188 in US at IEEExtreme 12.0 — Oct. 2018
Best Entrepreneurial Hack at HackUCI V hackathon — Feb. 2019
John Hollowell Composition Program Award for Best Advocacy Project (UCI) — May 2018
2017 VEX Robotics High School World Champion — Apr. 2017
Recognition for VEX Robotics Championship, Rep. Ro Khanna, CA-17 — Aug. 2017

RESEARCH AND PROFESSIONAL EXPERIENCE

Undergraduate Researcher — Oct. 2019 - Present
Intelligent Dynamics Lab, UC Irvine
Advisor: Roy Fox

Undergraduate Researcher — Oct. 2018 - Present
Mobley Lab, UC Irvine
PI: Professor David Mobley, Graduate Mentor: Jessica Maat

Software Engineering Intern, Mountain View, CA — Jun. 2019 - Sept. 2019
Google, Inc.

Engineering Practicum Intern, Mountain View, CA — Jun. 2018 - Sept. 2018
Google, Inc.

Independent Undergraduate Researcher — Oct. 2017 - Jun. 2018
Mentor: Professor Caesar Sereseres

PRESENTATIONS

Improving Molecular Simulations through Force Field Development and Computational Techniques
2019 UCI Undergraduate Research Symposium

Implications of Mall Security Robots on Privacy of Shoppers
2018 UCI Undergraduate Research Symposium

SELECTED PROJECTS

Improving Molecular Simulations through Force Field Development and Computational Techniques Oct. 2018 - Present

Associated with: Undergraduate Researcher at Mobley Lab

smirnoff99Frosst is a molecular dynamics force field, a set of parameters which defines how atoms interact in a system. Like many force fields, smirnoff99Frosst lacks parameters for improper torsions, which determine the planarity of molecules. This project involves building a pipeline which analyzes the eMolecules database of 6 million molecules to create new parameters, thus increasing the accuracy of smirnoff99Frosst.

Utilize All Parameters May 2019 - Jun. 2019

Associated with: Undergraduate Researcher at Mobley Lab

To benchmark a molecular dynamics force field, one needs a set of molecules which exercises all of the force field's parameters. Here, a greedy solution to the weighted set cover problem was used to select such a set for the smirnoff99Frosst force field from the eMolecules database of 6 million molecules. Paper in preparation to be submitted Fall 2019.

Multithreaded Affinity Clustering Jun. 2019 - Sept. 2019

Associated with: Software Engineering Intern at Google

Affinity clustering is a recent clustering algorithm which approximates the high quality of hierarchical agglomerative clustering while running in linear time. In this project, a multithreaded version of affinity clustering was implemented, optimized, and evaluated. Ultimately, this algorithm has applications in Ads and Search quality.

Safeline Feb. 2019

Associated with: Best Entrepreneurial Hack at HackUCI V hackathon

Falls are one of the leading causes of injury for the elderly. In this hackathon project, a Raspberry Pi, a camera, and OpenCV were used to detect falls and send alerts to an iPhone.

3P Agent Crawl Tool Jun. 2018 - Sept. 2018

Associated with: Engineering Practicum Intern at Google

Third-party (3P) agents are plugins which provide additional functionality to Google Assistant. This project involved building a tool which evaluates an agent by analyzing its responses to thousands of relevant queries.

Implications of Mall Security Robots on the Privacy of Shoppers Oct. 2017 - Jun. 2018

Associated with: Independent Undergraduate Researcher with Dr. Sereseres

This independent project explored several privacy concerns which arise as a result of the introduction of security robots into malls.

SELECTED CLASSES

Recent

Machine Learning and Data Mining
Formal Languages and Automata
Computer Graphics

Upcoming

Project in AI
Optimal Control and Reinforcement Learning

LEADERSHIP & SERVICE ACTIVITIES

Internal Vice President, Competitor Sept. 2017 - Present

ACM, UC Irvine Chapter

- Collaborate in teams of three to solve algorithm problems in programming contests such as ICPC
- Train other students to compete by organizing events such as a series of 3 campuswide competitions

Speaker, Volunteer 2017-2019

Google Girl-Powered VEX Robotics Workshop

- Annual workshop aimed at increasing female involvement in STEM and VEX Robotics

SKILLS

Languages:	C++, C, Python, Java, JavaScript, Haskell, SQL, Bash, Markdown, Latex, HTML/CSS
Libraries and Frameworks:	PyTorch, TensorFlow, NumPy, Matplotlib, pytest, Google Test, React.js, Jekyll
Tools:	Vim, tmux, Git, Linux commands, Google suite, Inkscape
Natural Languages:	English (fluent), Mandarin (proficient)