

# BRYON TJANAKA

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## RESEARCH INTERESTS

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

## EDUCATION

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**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

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NSF GRFP Honorable Mention Mar. 2020  
UCI Dean's Honor List Sept. 2017 - Present  
UCI Regents' Scholarship Sept. 2017 - Jun. 2020  
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<sup>th</sup>/88 at ACM ICPC 2019 SoCal Regional Nov. 2019  
9<sup>th</sup>/98 at ACM ICPC 2018 SoCal Regional Nov. 2018  
16<sup>th</sup>/105 at ACM ICPC 2017 SoCal Regional Nov. 2017  
39<sup>th</sup>/4103 in world, 4<sup>th</sup>/202 in US at IEEEExtreme 13.0 Oct. 2019  
74<sup>th</sup>/4049 in world, 7<sup>th</sup>/188 in US at IEEEExtreme 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

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**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

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**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

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### 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

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### Recent

Machine Learning and Data Mining  
Formal Languages and Automata  
Computer Graphics

### Upcoming

Project in AI  
Optimal Control and Reinforcement Learning

## LEADERSHIP & SERVICE ACTIVITIES

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### 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

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**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)