BRYON TJANAKA

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RESEARCH INTERESTS

quality diversity optimization, evolutionary algorithms, reinforcement learning, human-robot collaboration

EDUCATION

Ph.D. Computer Science Aug. 2020 - Present
University of Southern California (Los Angeles, California, USA)
Advisor: Stefanos Nikolaidis

B.S. Computer Science (ICS Honors program, AI specialization) Sept. 2017 - Jun. 2020
University of California, Irvine (Irvine, California, USA)
GPA: 4.0/4.0 • **GRE:** 170/170 quant., 161/170 verbal, 5/6 writing

High School Aug. 2013 - May 2017
Bellarmine College Preparatory (San Jose, California, USA)
GPA: 4.3/4.0 • **SAT:** 2350/2400

HONORS AND AWARDS

National Science Foundation Graduate Research Fellowship Mar. 2021
George Bekey Fellowship (USC) Feb. 2021
USC Graduate School Fellowship for Incoming Students Feb. 2020
Summa Cum Laude, UCI School of ICS Jun. 2020
National Science Foundation Graduate Research Fellowship Honorable Mention Mar. 2020
UCI Dean's Honor List Sept. 2017 - Mar. 2020
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^{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 School of Humanities 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

Research Assistant Aug. 2020 - Present
ICAROS Lab, University of Southern California
Advisor: Stefanos Nikolaidis

Undergraduate Researcher Oct. 2019 - Jun. 2020
Intelligent Dynamics Lab, UC Irvine
Advisor: Professor Roy Fox

Undergraduate Researcher Oct. 2018 - Jun. 2020
Mobley Lab, UC Irvine
PI: Professor David Mobley, Graduate Mentor: Jessica Maat

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

Software Engineering Intern, Google Ads — Jun. 2020 - Aug. 2020
Software Engineering Intern, Google Ads — Jun. 2019 - Sept. 2019
Engineering Practicum Intern, Google Assistant — Jun. 2018 - Sept. 2018
Google, Inc. (Mountain View, California, USA)

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

ATTENDED CONFERENCES

ICLR 2020 (virtual; received travel award) — April 2020
UCI Undergraduate Research Symposium — May 2018, May 2019

ORGANIZED CONFERENCES

Webmaster, SoCal Graduate Pathways to STEM (`http://vgsa.usc.edu/gps/`) — Oct. 2020

MENTORSHIP

Sam Sommerer (undergraduate, ICAROS Lab) — Aug. 2020 - Present

LEADERSHIP & SERVICE ACTIVITIES

Senator — Aug. 2020 - Present
USC Graduate Student Government
Webmaster — Aug. 2020 - Present
USC Viterbi Graduate Student Association
Internal Vice President, Competitor — Sept. 2017 - Feb. 2020
ACM, UC Irvine Chapter
Speaker, Volunteer — Jul. 2017, Aug. 2018, Jun. 2019
Google Girl-Powered VEX Robotics Workshop

SELECTED PROJECTS

Actor-Critic by Committee (ACBC) — Oct. 2019 - Jun. 2020
Associated with: Undergraduate Researcher at Intelligent Dynamics Lab
Hierarchical reinforcement learning algorithms typically use a high-level controller to compose sub-policies sequentially or combinationally. Inspired by work on ensembles, we developed an algorithm, ACBC, in which outputs from multiple sub-policies, or experts, are composed with a linear combination. As the experts can control their weights, ACBC performs both sequential and combinational composition without a high-level controller.

Improving Molecular Simulations through Force Field Development and Computational Techniques — Oct. 2018 - Jun. 2020
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 involved building a pipeline which analyzes the eMolecules database of 6 million molecules to create new parameters, thus increasing the accuracy of smirnoff99Frosst.

Multithreaded Affinity Clustering — Jun. 2019 - Sept. 2019
Associated with: Software Engineering Intern at Google
Affinity clustering is a 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. This work is included in two pending publications.