BRYON TJANAKA

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RESEARCH INTERESTS

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

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

USC Graduate School Fellowship for Incoming Students	Feb. 2020
Summa Cum Laude, UCI School of ICS	Jun. 2020
NSF GRFP 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
7th/88 at ACM ICPC 2019 SoCal Regional	Nov. 2019
9th/98 at ACM ICPC 2018 SoCal Regional	Nov. 2018
16th/105 at ACM ICPC 2017 SoCal Regional	Nov. 2017
39th/4103 in world, 4th/202 in US at IEEExtreme 13.0	Oct. 2019
74th/4049 in world, 7th/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
  Google, Inc. (Mountain View, California, USA)

Software Engineering Intern, Google Ads   Jun. 2019 - Sept. 2019
    Google, Inc. (Mountain View, California, USA)
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

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.

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. This work is included in a pending publication.

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.

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 COURSES

Neural Networks and Deep Learning	Spring 2020
Optimal Control and Reinforcement Learning	Winter 2020
Formal Languages and Automata	Spring 2019

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