Victor Ardulov

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EDUCATION

University of Southern California   August 2017 - *Present*
Doctor of Philosophy,*Computer Science*
Advisor: Shrikanth Narayanan
Expected Graduation: 2022

University of Southern California   August 2017 - December 2018
Master's of Science,*Computer Science*

University of California, Santa Cruz   September 2013 - June 2016
Bachelor's of Science with Honors, *Computer Engineering*
Concentration: Robotics and Control Systems
Senior Project: Motor Assistive Glove

RESEARCH EXPERIENCE

Research Assistant   August 2017 - *Present*
Signal Analysis and Interpretation Lab, Los Angeles, CA

- Studying the application of dynamical systems in analyzing goal-oriented interactions

- Iterative control and reinforcement learning policies for adaptive and interactive

- Computational analysis and natural language processing of Child Forensic Interviews towards improving techniques and modeling interaction dynamics

- Created Python3 implementation of Dynamic Mode Decomposition Methods for time-series analysis

- Using unsupervised learning towards personalized behavioral intervention for alcohol and narcotics abuse recovery in homeless youth

- End-to-end affect-aware spoken negotiation bot towards understanding how emotions and spoken dialogue influence human decision making

Chief Scientist - Co-founder
Calypso AI, San Mateo, CA

September 2018 - *Present*

- Development of AI and Machine Learning tools for robust, and verifiable systems

- Developed, designed, and implemented methods around automating benchmarking, and analyzing machine learning models

- Assessed methods for validating and verifying machine learning based models against different attack based on model vulnerability and attack severity

- Investigated feasibility and value of applying different defense and validation mechanisms surrounding data compression and encoding to protect machine learning models in deployment

Research Software Engineer
HRL Laboratories LLC, Malibu, CA

October 2016 - September 2018

- Developed mathematical frameworks for improved dynamical analysis for systems-of-systems

- Reinforcement Learning for complex multi-agent cooperation with hindered communication

- Natural Language Processing for human-machine hybrid forecasting

Volunteer Researcher
Jet Propulsion Laboratory, Pasadena, CA

June 2016 - October 2016

- Developed Virtual Reality tools for Earth science missions for immersive data visualizations

- Deployed work across multiple VR and non-VR platforms

- Presented work at IEEE VR 2017

- Presented work at SIGGRAPH 2016 - Virtual Village

Summer Intern
Jet Propulsion Laboratory, Pasadena, CA

June 2015 - September 2015

- Developed new Mars geo-spatial visualization tool for operations analysis and planning.

- Presented Work at AIAA 2015

Undergraduate Research Fellow
Baskin School of Engineering, Santa Cruz, CA

September 2014 - June 2016

- Developed and built prototype of motor assistive glove for patients recovering from stroke as member of CITRIS

- Assisted in developing and testing autonomous system technologies for water and land vehicles

- Recipient of Dean's Award for Excellence in Engineering

- Recipient of Crown College Undergraduate Research Fellowship award

TEACHING EXPERIENCE

Undergraduate Student Mentor   January 2018 - *Present*

SAIL, Los Angeles, CA

- Assisting undergraduate students at USC organize and progress research projects

- Developing skills to conduct research and prepare for future research opportunities

Graduate Teaching Assistant   August 2020 - December 2020

USC, Los Angeles, CA

- Produce, administer, and grade course work for undergraduate Introduction to Artificial Intelligence course

- Run discussion sessions exploring topics deeper than in lecture/those not covered in lecture.

Graduate Teaching Assistant   August 2019 - December 2019

USC, Los Angeles, CA

- Produce, administer, and grade course work for undergraduate Introduction to Robotics course

- Run laboratory sections instructing and advising students in programming and electronics related assignments

Discipline Lead   January 2017 - July 2018

MindMakers Project, Los Angeles, CA

- Developing curriculum and assignments to deliver electrical engineering fundamentals

- Teaching electronics essentials to underrepresented groups in engineering, with potentially limited background in subject

- Integrating electronics and embedded systems design content within context of mechanical and software design components.

Computer Engineering Tutor   January 2015 - March 2016

Baskin School of Engineering, Santa Cruz, CA

- Provided supplemental instruction to lectures in Introduction to Computing Systems and Assembly

- Lead lab sections for multiple for Introduction to Computing System and Assembly, as well as, Computer Systems and C Programming

- Aided in the design of laboratory assignments and examinations

PUBLICATIONS and ABSTRACTS

Ardulov, V., Martinez, V. R., Somandepalli, K., Zheng, S., Salzman, E., Lord, C., ... and Narayanan, S. (2021). Robust diagnostic classification via Q-learning. Scientific reports, 11(1), 1-9.

Durante, Z., **Ardulov, V.**, Kumar, M., Gongola, J., Lyon, T., and Narayanan, S. (2021). Causal indicators for assessing the truthfulness of child speech in forensic interviews. Computer Speech & Language, 101263.

Flemotomos, N., Martinez, V. R., Chen, Z., Singla, K., **Ardulov, V.**, Peri, R., ... and Narayanan, S. (2021). Automated Evaluation Of Psychotherapy Skills Using Speech And Language Technologies. arXiv preprint arXiv:2102.11265.

Klein, L., **Ardulov, V.**, Hu, Y. Soleymani, M. Gharib, A. Thompson, B. Levitt, P., and Matarić, M.J. (2020, October). Incorporating Measures of Intermodal Coordination in Automated Analysis of Infant-Mother Interaction. In 2020 International Conference on Multimodal Interaction.

V. Ardulov, K. Somandepalli , N. Anand , S. Zheng , E. E. Salzman , S. Bishop , C. Lord and S. Narayanan , Identifying Measured Characteristics on ADOS, ADI-R and SRS Differentiating ASD from ADHD, International Society for Autism Research, Virtual Meeting, 2020

C. Farmer , **V. Ardulov** , M. Kumar , A. J. Kaat , A. Thurm , S. Kanne , S. Georgiades , S. Narayanan , S. Bishop and C. Lord, Identification of Parent-Report Questions Which Elicit the Most Accurate Estimates of Language Ability, International Society for Autism Research, Victural Meeting, 2020

Chen, Z., Flemotomos, N., **Ardulov, V.**, Creed, T. A., Imel, Z. E., Atkins, D. C., and Narayanan, S. (2020). Feature Fusion Strategies for End-to-End Evaluation of Cognitive Behavior Therapy Sessions. arXiv preprint arXiv:2005.07809.

Ardulov, V., Durante, Z., Williams, S., Lyon, T., and Narayanan, S. (2020, May). Identifying Truthful Language in Child Interviews. In ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 8074-8078). IEEE.

Martinez, V.R., Flemotomos, N., **Ardulov, V.**, Somandepalli, K., Goldberg, S.B., Imel, Z.E., Atkins, D.C., Narayanan, S. (2019) Identifying Therapist and Client Personae for Therapeutic Alliance Estimation. Proc. Interspeech 2019, 1901-1905, DOI: 10.21437/Interspeech.2019-2829.

Victor Ardulov, Madelyn Mendlen, Manoj Kumar, Neha Anand, Shanna Williams, Thomas Lyon, and Shrikanth Narayanan. 2018. Multimodal Interaction Modeling of Child Forensic Interviews. In Proceedings of the 19th ACM International Conference on Multimodal Interaction (ICMI 2017). ACM, New York, NY, USA. *(To appear)* DOI: https://doi.org/10.1145/3242969.32430061

V. Ardulov, M. Kumar, S. Williams, T. Lyon, and S. Narayanan. 2018. Measuring Conversational Productivity in Child Forensic Interviews. ArXiv e-prints (June 2018). arXiv:cs.CL/1806.0335

Ardulov, V., & Pariser, O. (2017). Immersive data interaction for planetary and earth sciences. In Proceedings - IEEE Virtual Reality. https://doi.org/10.1109/VR.2017.7892277

Pariser, O., Calef, F., Manning, E.M., **Ardulov V.** (2017). Immersive Interaction, Manipulation and Analysis of Large 3D Datasets for Planetary and Earth Sciences. In *AGU Fall Meeting Abstracts*

PATENTS

Ardulov, V., Serebryany, N., Sweatt, T., and Gibian, D. (2020). Artificial intelligence adversarial vulnerability audit tool, U.S. Patent No. 10,839,268. Washington, DC: U.S. Patent and Trademark Office.

Serebryany, N., Quinlivan, B., **Ardulov, V.**, Moisejevs, I., and Gibian, D. R. (2020). Machine learning model robustness characterization, U.S. Patent No. 10,846,407. Washington, DC: U.S. Patent and Trademark Office.

Ardulov, V., Jammalamadaka, A., and Lu, T. C. (2020). System and method for learning contextually aware predictive key phrases, U.S. Patent Application No. 16/710,640.