Gaurav Kuppa

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Areas of Interest

Machine Learning, Deep Learning, Computer Vision, Neural Rendering, Reinforcement Learning, Robotics, Energy Systems, Software Engineering, Reusability, Embedded Systems

Education

08/2017 - 12/2020 San Jose State University, San Jose, CA
Bachelor of Science in Computer Engineering
GPA: 3.64

Experience

06/2020 - 09/2020 **Machine Learning Intern, Aerospace Corporation, Los Angeles, CA**

- Tested different reinforcement learning algorithms, Clipped PPO, DQN, and DDQN, in robotic applications by using RL-Coach, ROS, and Gazebo to simulate space satellite rendezvous
- Streamlined communication between AWS RoboMaker and AWS SageMaker and ran Bayesian hyperparameter tuning to improve training
- Implemented time-series alignment algorithm; demonstrated an 84% decrease in dynamic time warping distance

01/2020 - Present **Generative Modeling Research Assistant, Department of Computer Science, San Jose State University, San Jose, CA**

- Worked with Dr. Ziwei Liu and Dr. Teng Moh to design a virtual try-on network with self-attention, DensePose annotations, and smooth activation functions to improve the quality of garment transfer while reducing training time and memory usage
- Conducted research about generative adversarial networks,

image-to-image translation, 3D modeling, and style transfer
- Investigated novel ideas using PyTorch to achieve precise control of generated media; our methods created a 12% increase in try-on quality with greater body and cloth texture detail

06/2018 - Present **Software Engineering Research Assistant, Department of Computer Engineering, San Jose State University, San Jose, CA**
- Working with Dr. Mohamed Fayad on "Unified Software Architecture for Stable Machine Learning" by determining functional and nonfunctional requirements and designing stable pattern language - which resulted in a Software Stability Model
- Executing scenario-based testing to define core knowledge through functional and non-functional requirements for unified software architecture
- Design Unified Modeling Languages(UML) and Software Stability Models using MS Visio

06/2019 - 08/2019 **SURE Research Intern, Information Sciences Institute, University of Southern California, Los Angeles, CA**
- Created a course scheduler using Python and toulbar2, a cost-function optimization tool, to generate top K hypotheses given a set of constraints
- Conducted research at Collaboratory for Algorithmic Techniques and Artificial Intelligence related to translating from n-ary encodings to boolean encodings
- Presented research findings to 30 people, including fellow research interns, Ph.D. students, and advisors

Publications

Peer-Reviewed Conferences

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1. Fayad, Mohamed E., and Kuppa, G. "Stable Machine Learning Knowledge Map Domain Analysis." *Proceedings of the Future Technologies Conference*. Springer, Cham, 2020.
2. Fayad, M. E., Kuppa, G., Jindal, S., & Hamu, D. (2019, October). A Cutting-Edge Unified and Stable Rule Design Pattern. *Proceedings of the Future Technologies Conference* (pp. 644-653). Springer, Cham.
3. Fayad, Mohamed E., Kuppa, G., and David Hamu. "Unified and Stable Project: “Ushering in the Future”." *Proceedings of the Future Technologies Conference*. Springer, Cham, 2019.

Journals

1. Fayad, Mohamed E., and Kuppa, G. "Unified and Stable Privacy Model". *International Journal of Advanced Trends in Computer Science and Engineering* 8. (2019): 515-521.

Workshops

1. Kuppa, G., Jong, A. Liu, V., Liu, Z., Moh, T. “ShineOn: Illuminating Design Choices for Practical Video-based Virtual Try-on”. *To Appear in Generation of Human Behavior Workshop at WACV 2021*.

Services

President	**ML@SJSU, San Jose State University, San Jose, CA** ● Organized panel titled “Saving Our Planet - Energy, Climate & AI” to discuss climate change and inspire student action ● Presented workshops and taught material in Machine Learning, Deep Learning, Reinforcement Learning, and Computer Vision ● Introduced club committee structure and recruited members
Autonomy Lead	**SJSU Robotics, San Jose State University, San Jose, CA** ● Used OpenCV to implement image pre-processing and used TensorFlow to implement Faster R-CNN with transfer learning to create region proposals and real-time pole-identification ● Trained YoloV3 with DarkNet backbone using 16-bit precision training and deployed object-detection model onto NVIDIA Jetson Nano using ROS to inform the robot's actions using visual insights
Project Lead	**Senior Project, San Jose State University, San Jose, CA** ● Created high-level software architecture to communicate between SJ2 microcontroller and Raspberry Pi 4 ● Implemented real-time embedded flight controller; utilized cascade control loop and quaternion rotations with FreeRTOS and C ● Demonstrate mapping, localization, and path planning in simulation using ROS and Gazebo
Member	Theta Tau, Software and Computer Engineering Society, ACM, IEEE

Awards

2020	**1st Place in Video Virtual Try-On Challenge,** CVPR 2020
2019	**Dean Scholar,** San Jose State University
2018	**SVIC Showcase Finalist,** San Jose State University

References

1. Dr. M.E. Fayad
   Professor, Department of Computer Engineering, San Jose State University,
   One Washington Square, San Jose, CA 95192-0180. | Ph: (650) 804-5754
   E-mail: m.fayad@aeehitg.com | Web: http://drfayad.com/

2. Dr. Teng Moh
   Professor, Department of Computer Science, San Jose State University,
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3. Dr. Ziwei Liu
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