Ying-Sheng Luo

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https://ysluo.github.io/

EDUCATION

National Taiwan University of Science and Technology Taipei, TW
BS in Computer Science *GPA: 3.94/4.00* Sep 2013 - Jun 2016

National Taiwan University of Science and Technology Taipei, TW
MS in Computer Science *GPA: 4.13/4.30* Sep 2016 - Jun 2018

WORK EXPERIENCE

Research Engineer, Inventec Corporation July 2018 - Present

- Published international conference papers on quadruped robots, covering topics such as learning diverse skills, skill transitions, motion smoothing, perception, and navigation.
- Applied Sim2Real techniques to successfully transfer reinforcement learning (RL) policies from simulation to the Unitree A1 robot to perform many skills.
- Developed RL frameworks for learning locomotion skills for quadruped and biped characters.
- Built an iOS APP and a backend RESTful API server with Kafka job queues for AI product deployment.

Graphics Engineer Intern, International Games System Corporation June 2015 - July 2015

- Implemented color grading, dynamic clouds, lightmaps, and HDR cubemap using GLSL and Cocos2d.
- Explored GPU performance analysis tool to improve rendering performance on mobile devices.

SKILLS

Programming Languages:	C++, Python, C#, OpenGL, GLSL, Swift
Tools:	NVIDIA Isaac Gym, Pytorch, TensorFlow, Unity, Blender
Research Interests:	Deep Reinforcement Learning, Machine Learning, Computer Animation, Computer Graphics and Real-time Rendering

PUBLICATIONS

Journals & Conferences

- Guilherme Christmann, **Ying-Sheng Luo**, Hanjaya Mandala, and Wei-Chao Chen. Benchmarking Smoothness and Reducing High-Frequency Oscillations in Continuous Control Policies. *IEEE International Conference on Intelligent Robots and Systems* (IROS 2024).
- Guilherme Christmann, **Ying-Sheng Luo**, and Wei-Chao Chen. Expert Composer Policy: Scalable Skill Repertoire for Quadruped Robots. *IEEE International Conference on Robotics and Automation* (ICRA 2024).
- Guilherme Christmann, **Ying-Sheng Luo**, Jonathan Hans Soeseno, and Wei-Chao Chen. Expanding Versatility of Agile Locomotion through Policy Transitions Using Latent State Representation. *IEEE International Conference on Robotics and Automation* (ICRA 2023).
- Po-Hsuan Huang, Yi-Hsiang Pan, **Ying-Sheng Luo**, Yi-Fan Chen, Yu-Cheng Lo, Trista Pei-Chun Chen, Cherng-Kang Perng. Development of a Deep Learning-Based Tool to Assist Wound Classification. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, 2023.
- Jonathan Hans Soeseno, **Ying-Sheng Luo**, Trista Pei-Chun Chen, and Wei-Chao Chen. Transition Motion Tensor: A Data-Driven Approach for Versatile and Controllable Agents in Physically Simulated Environments. *SIGGRAPH Asia 2021 Technical Communications* (Proc. SIGGRAPH Asia 2021).
- **Ying-Sheng Luo**, Jonathan Hans Soeseno, Trista Pei-Chun Chen, and Wei-Chao Chen. CARL: controllable agent with reinforcement learning for quadruped locomotion. *ACM Transactions on Graphics* (Proc. SIGGRAPH 2020), 39, 4, Article 38.
- Zhong-Qi Cai, **Ying-Sheng Luo**, Yu-Chi Lai, Chih-Shiang Chan, Wen-Kai Tai. Interactive Iconized Grammar-Based Pailou Modelling. *Computer Graphics Forum*, Vol. 39, No. 1 (2020).
- Kuo-Wei Chen, **Ying-Sheng Luo**, Yu-Chi Lai, Yan-Lin Chen, Chih-Yuan Yao, Hung-Kuo Chu, Tong-Yee Lee. Image Vectorization With Real-Time Thin-Plate Spline. *IEEE Transactions on Multimedia* (TMM), Vol. 22, No. 1 (2020).

Books

- Hung-Kuo Chu et al. OpenGL 3D real-time rendering programming. 2018. Flag Technology. (ISBN-13: 9789863125112) - Author of Chapter 13. Advanced Rendering Techniques and Chapter 16. Post-Processing.
- Yu-Chi Lai et al. Popular games do this! Unity3D Game Design Example Lecture 2nd Edition. 2016. Flag Technology. (ISBN-13: 9789863123552) - Author of Chapter 4. Character Animation.

Patents

- **Ying-Sheng Luo**, Jonathan Hans Soeseno, Trista Pei-Chun Chen, and Wei-Chao Chen. Method for Training Locomotion Controller of Robotic Animal. Taiwan patent I739604. Sep. 11, 2021.

PROJECTS

Robotics Perceptions and Navigation (2024-Present): Trained control policies in NVIDIA Isaac Gym to navigate complex uneven terrains. Using a Teacher-Student training scheme, successfully deployed a perception-enabled policy on the Unitree A1 quadruped robot, equipped with an Intel RealSense depth camera.

Robotics Skill Transitions (2023-2024): Developed Transition-Net, a strategy to expand robot skill versatility by identifying viable transitions between policies. Later introduced the Composer Policy, which links policy pairs via transitions to a sampled target state, enabling sequential composition. This approach allows incremental repertoire expansion while preserving motion quality without retraining or fine-tuning.

Robotics Sim2Real Transfer (2022-2023): Trained control policies in NVIDIA Isaac Gym to imitate motion capture data. By applying additional domain randomization during the training process, we were able to successfully deploy these policies on the real-world Unitree A1 quadruped robot.

Physics-based Character Animation (2020-2022): Create simulated characters learned from motion capture data using Deep-RL and GAN such that the character produces natural movements while obeying high-level user directives.

I-SWAT: AI-assisted diagnostics software in skin wound (2020-2021): Developed an iOS app (Swift) and a backend inference server (PHP, Nginx, Kafka) for AI-assisted skin wound diagnostics. The app obtained a security certification from Gapertise.

Interior Lighting Design (2017-2018): Created a framework for adaptive lighting control based on sunlight and weather conditions. Utilized precomputed radiance transfer and spherical harmonics lighting to compute global illumination in 3D interior scenes, maximizing comfort.