

YUXIANG LUO

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Education

The Ohio State University

Columbus, Ohio, United States

- Computer Science and Engineering, Ph.D. 2020 - 2026
- Welding Engineering, M.S. in Materials Science and Engineering 2020 - 2023
- Computer Science and Engineering, B.S. 2017 - 2020

Research Projects

Process-Procedure-Property Optimization through Reinforcement Learning

April 2019 - Current

- PI: Dr. Andrew Perrault CSE, OSU
- Sequential process optimization through reinforcement learning on continuous space and image state (CV, PPO, SAC, (D)DPG, Bayesian Optimization, etc.)

Quantification and Optimization of Temper Bead Welding

April 2019 - August 2023

- PI: Dr. Boian Alexandrov Welding Engineering, MSE, OSU
- Simulate and optimize the metal joining process of temper bead welding using Finite Element Analysis (FEA) model, Design of Experiment (DoE) and Bayesian Optimization.
- Sponsored by EWI, EPRI, Shell, TechnipFMC, Schlumberger and AZZ.

Contextual Optimization of High-Performance Recipes for Additive Manufacturing through Reinforcement Learning-Driven Human Interaction

December 2023 - Current

- PIs: Dr. Andrew Perrault, Dr. Boian Alexandrov, Dr. Joel Paulson OSU
- Parameter optimization of the high-performance recipes for additive manufacturing with Bayesian Optimization, gradient ascent, and reinforcement learning algorithms.

Publications

Process Optimization Framework for Temper Bead Welding Procedures.

Y. Luo. The Ohio State University, Master's thesis. 2023.

Quantification of the Tempering Response for Temper Bead Welding of SA-508 Low Alloy Steel.

E. Jang, Y. Luo, B. Alexandrov, S. McCracken, J. Tatman, & D. Barborak, Pressure Vessels and Piping Conference. 2022.

Tempering Efficiency Evaluation for Dissimilar Weld Overlays

E. Jang, J. Stewart, Y. Luo, S. Qu, B. Alexandrov, S. L. McCracken, J. Tatman, D. Barborak, & J. A. Penso, Pressure Vessels and Piping Conference. 2020

Acoustic-turf:Acoustic-based Privacy-preserving Covid-19 Contact Tracing

Y. Luo, C. Zhang, Y. Zhang, C. Zuo, D. Xuan, Z. Lin, A. C. Champion, & N. Shroff, ArXiv, 2020.

Skills

- Machine Learning: PPO, SAC, (D)DPG, TD3, **Contrastive Learning**, Bayesian Optimization, etc.
- Platforms: TensorFlow, **PyTorch**, Keras, JAX
- Docker, AWS, Linux, Django, LaTeX, PostgreSQL, Python, Cython,C/C++; SolidWorks, Abaqus.

Presentations

Process Optimization Framework for Temper Bead Welding	FebTech, 2023
Reinforcement Learning for Finite Element Model Optimization	MMLS, 2023
Modeling and Validation of Temper Bead Weld Overlays	Ma ² JIC, 2020~2023
Automated Heat Source Calibration for Welding Processes	AWS AWAMR, 2022
FEA Model Based Simulation of Temper Bead Welding	AWS PROFESSIONAL, 2021
Temper Bead Welding	AWS FABTECH, 2020

Pattern and Inventions

Computational Design of Experiment Framework for Process-Microstructure-Property Optimization in Metallic Alloys Subjected to Multiple Reheat Processing