173 Foster Road, NY 10309, USA
+1 585-204-7937
anar.nurizada@gmail.com
anar-nurizada-609189177

Anar Nurizada

Education

Jan 2021 – Present **Ph.D. in Mechanical Engineering, Minor in Computer Science**, *Stony Brook University*, NY, USA.

Jan 2020 – Dec 2020 **M.S. in Mechanical Engineering**, *Stony Brook University*, NY, USA, *GPA: 3.82*.

Experience

Sep 2020 – Present **Graduate Research Assistant**, *Stony Brook University*, Stony Brook, NY.

- Designed four multi-modal generative models for path synthesis in mechanical engineering:
  1. Transformer-based model with LLaMa2 features and MLP for mechanism type prediction.
  2. Conditional beta VAE with cross-attention mechanisms, integrated conditions, and Classifier Free Guidance.
  3. Conditional graph-VAE model with Classifier Free Guidance.
  4. Image-based VAE and MLP for mapping between latent space and mechanism representation.
- Implemented object detection algorithms and post-processing techniques for sketch conversion by fine-tuning YOLOv4.
- Led end-to-end research projects, including dataset creation, data preprocessing, model validation, and augmentation.
- Demonstrated deep expertise in neural network architectures, loss functions, and data manipulation tools including PyTorch (Lightning), NumPy, SciPy, Matplotlib, and scikit-learn.
- Managed dataset updates via Kaggle and utilized online GPU services (Lambda, VAST.AI). Worked with Linux, CUDA and presented work at annual ASME conferences in 2021 - 2023.

Oct 2019 – Dec 2020 **Mechanical Engineer Intern**, *Flower Turbines LLC*, Stony Brook, NY.

- Modeled wind turbines' interactions with rooftops through advanced simulations, enhancing reliability and performance.
- Conducted comprehensive cost-benefit analysis for data-driven project profitability and sustainability decisions.
- Validated structural integrity of designs with rigorous wind load simulations using Ansys.
- Designed novel rooftop installations for wind turbines with Autodesk Inventor CAD.

Jun 2019 – Sep 2019 **Summer Mechanical Engineer Intern**, *BP*, Baku, Azerbaijan.

- Supported onshore operations for seamless project execution with contractors.
- Expert in materials management, coordination, and standards compliance.
- Oversaw valve sizing, certification, and repairs to enhance efficiency and safety.
- Led piping design and stress analysis to optimize installations and improve structural integrity.

Sep 2018 – May 2020 **Undergraduate Research Assistant**, *Stony Brook University*, Stony Brook, NY.

- Explored 3D printed part anisotropy with size effect methods, enhancing materials science research.
- Created accurate test specimens via advanced 3D printing and modeling.
- Performed detailed 3-point bending tests using Instron equipment and analyzed data.
- Skilled in piping design, stress analysis, and optimizing installations for better performance and integrity.

Publications

2024 **Nurizada, A.**, Lyu, Z., Purwar, A.. "Path Generative Model based on Conditional β- Variational Auto Encoder for Mechanism Design." *ASME JMR*. Under review.

2024 **Deng, X.**, **Nurizada, A.**, Purwar, A.. "Synthesizing Spatial RSCR Mechanisms for Path Generation using a Deep Neural Network." *Frontiers of Mechanical Engineering*. Under review.

2023 **Nurizada, A.**, Purwar, A.. "An invariant representation of coupler curves using a variational AutoEncoder: Application to path synthesis of four-bar mechanisms." *ASME JCISE*, doi:10.1115/1.4063726.

2022 **Nurizada, A.**, Purwar, A.. "Transforming hand-drawn sketches of linkage mechanisms into their digital representation." *ASME JCISE*, doi:10. 1115/1.4064037

2021 **Nurizada, A.**, Kirane, K.. "Induced anisotropy in the fracturing behavior of 3d printed parts analyzed by the size effect method." *Engineering Fracture Mechanics*, 239, 107304. doi:https://doi.org/10. 1016/j.engfracmech.2020.107304