Shilaj Baral

Graduate Student Researcher

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Skills

- Python
- C++
- OpenFOAM
- Artificial Intelligence

Education

Western Region Campus / Bachelor in Electronics and Communication Engineering
August 2016 - Sep 2021, Lamachaur, Pokhara

Jeonbuk National University / Graduate School of Integrated Energy-AI
September 2023 - present, Jeonju, South Korea
Building ML-CFD hybrid computational solver

Experience

Grepsr Pvt. Ltd. / Data QA Analyst
Aug 2022 - Aug 2023, Kathmandu, Nepal

- Handling CI/CD pipeline
- Statistical data generation tool developement

Jeonbuk National University / Graduate Student Researcher
Sep 2023 - present, Jeonju, South Korea

- Simulating fluid flows using CFD solver.
- Apply DL strategies to fluid flow problems.

Publications

S. Baral, S. Khanal, J. Jeon,XRePIT: An executable and extendible ML-CFD hybrid solver, **under review.**

S. Khanal**, S. Baral,** J. Jeon**,** Comparison of CNN-based deep learning architectures for unsteady CFD acceleration on small datasets, Nuclear Engineering and Technology 57 (2025) 103703.

J.Jeon*, J. Rabault, J. Vasanth, F. Alcántara-Ávilad, **S. Baral**, R. Vinuesa, Inductive biased-deep reinforcement learning methods for flow control: group-invariant and positional-encoding networks improve learning reproducibility and quality, Physics of Fluids 37 (2025) 077189.

Activities

- Paper presentation (oral) in NURETH-21
- Paper presentation (oral) in KNS spring meeting 2025
- Poster presentation in NTHAS-13

Summary

A student researcher focused on hybrid CFD–ML. Built RePIT, an open-source framework that couples OpenFOAM with neural operators/transfer learning for stable long-rollout acceleration, achieving speedups while preserving physics. Strong in PyTorch, OpenFOAM, CUDA, Docker, HPC workflows, and operator learning (DeepONet/CEOD). Seeking roles to advance reliable, physics-aware AI for complex flows in nuclear applications.