Shailesh **Mishra**

Computer Science · Research Engineer · Software Engineer · Python · C/C++ · Rust

(+49) 177-4132-163 | mshailesh2018@gmail.com | shailesh-mishra.com | shhra | shhra

Summary

My journey has been marked by a passion for melding computer science with art. With pioneering innovations in sign language animations and groundbreaking strides in 3D style transfers, I am deeply driven by the power of technology to revolutionize artistic expression. By harnessing this intersection, my mission is clear: to craft tools that not only empower artists but also redefine the boundaries of digital artistry, ensuring a legacy of innovation and impact.

Education

Saarland University

Saarbrücken, Germany

Master of Science in Computer Science — *2020-2023*

- **Relevant Coursework**: Computer Graphics, GPU Programming, Compiler Construction, High Level Computer Vision, Machine Learning, Realistic Image Synthesis, Generic and Generative Software Design

Pulchowk Campus, Tribhuvan University

Lalitpur, Nepal

Bachelor of Engineering in Computer Engineering — *2014-2018*

- **Relevant Coursework**: Artificial Intelligence, Simulation and Modelling, Discrete Signal Processing, Software Engineering, Operating Systems, Data Structure and Algorithms, Discrete Mathematics, Distributed Systems

Experience

German Research Center for Artificial Intelligence

Saarbrücken, Germany

Research Assistant — *Aug 2022 - Present*

- **Achieved up to 50+%** precise solution over current approaches pioneering a trajectory matching system for sign language animations using L-BFGS.
- **Realized a 100% efficient animation process** by engineering and optimizing an animation composer leveraging Inverse Kinematics, pushing the boundaries of realistic animations in the sign language field.
- **Interpreted and analyzed nuanced motion capture data for sign language**, creating a pioneering benchmark that emphasizes clarity and precision in animations.
- Architected the first-ever solution using the concepts of inflection parameters for sign language.
- Skills: **Python, Blender, Three.js, GPT4, Vue.js**

NVIDIA

Remote, Germany

Applied Deep Learning Research Intern — *Apr 2022 - Jul 2022*

- Worked with **Jonathan Granskog** and the team behind NVIDIA DLSS Technology.
- Accomplished **500% improvement – 2 hours to 20 minutes – in training speeds** by optimizing the deep learning pipeline through effective distributed training methods.
- Integrated CLIP-based ResNet50 - the foundation of modern image retrieval and diffusion methods - with NNFM and color loss for style transfer.
- Authored a technical paper acknowledged at **Eurographics 2023** and held an oral presentation of about 10 minutes at the conference.
- **Skills: Python, PyTorch, PyTorch Distributed**

Fusemachines

Kathmandu, Nepal

AI Engineer (Contract) — *Jan 2020 - Jul 2020*

- Researched and implemented different seminal architectures (ResNet, InceptionNet) on Computer Vision for Object Classification
- Formulated **comprehensive technical documentation**, lessons, and tutorials on deep learning methodologies, acting as a reference guide for the students.
- Led a small team of 4 people to work on crafting a course module for natural language understanding.
- **Skills: Python, Tensorflow, OpenCV, PyTorch**

Alternative Technology

Kathmandu, Nepal

Software Engineer (Contract) — *Nov 2018 - May 2019*

- **Reduced manual intervention** for augmentation of a 3D carpet into a 2D RGB image **by 95%** by engineering a plane detection algorithm ultimately improving the visualization.
- Initiated and developed automated design generation modules using cGANs, **resulting in a 10% increase** in design options available.
- Improved the **efficiency of design team by 20%** by architecting image retrieval tools for design lookup.
- **Skills: Python, Tensorflow, OpenCV, PyTorch**

Skills

Programming	C/C++, Python, Rust, CUDA
AI Frameworks	Pytorch, OpenCV, Tensorflow
Scripting	Python, Javascript, C#, bash
3D tools and Graphics	Unity, Blender, OpenGL, WebGPU, Vulkan, GLSL, ImGui, Three.js
Web Frameworks	Django, Flask, HTML5, TailwindCSS, Vue.js
Design	Figma, LaTeX, Krita
Familiar	Elixr, Scheme, Docker, PostgreSQL
Spoken Languages	English (Fluent), Nepali (Native), German (Basic)

Publications

- Greshake, Kai, Sahar Abdelnabi, **Mishra, Shailesh**, Christoph Endres, Thorsten Holz, and Mario Fritz. ``Not What You've Signed Up For: Compromising Real-World LLM-Integrated Applications with Indirect Prompt Injection''. In: *Proceedings of the 16th ACM Workshop on Artificial Intelligence and Security*. 2023.
- **Mishra, Shailesh** and Jonathan Granskog. ``CLIP-based Neural Neighbor Style Transfer for 3D Assets''. In: *Eurographics 2023 - Short Papers*. 2023.
- Nunnari, Fabrizio, Mina Ameli, and **Mishra, Shailesh**. ``Automatic Alignment Between Sign Language Videos And Motion Capture Data: A Motion Energy-Based Approach''. In: *2023 IEEE International Conference on Acoustics, Speech, and Signal Processing Workshops (ICASSPW)*. 2023.
- Nunnari, Fabrizio, **Mishra, Shailesh**, and Patrick Gebhard. ``Augmenting Glosses with Geometrical Inflection Parameters for the Animation of Sign Language Avatars''. In: *2023 IEEE International Conference on Acoustics, Speech, and Signal Processing Workshops (ICASSPW)*. 2023.

Selected Projects

FRAME INTERPOLATOR *2023*

- Passively working on frame interpolation project using AnimeRun dataset and Stable Video Diffusion model as the foundation.pr

ANIMATION ENGINE *2022*

- Engineered a custom **animation engine** for motion research including features such as **playback, retargetting and skinning** for BVH **motion capture data**, using **C++, OpenGL**.

DENOISER IN FRAGMENT SHADER *2021*

- As part of a 3-member team, formulated and realized a **denoiser network architecture** for denoising in fragment shader using **Python, GLSL**

PATH TRACER *2021*

- Implemented **path tracer** from scratch, incorporating algorithms like **Kajiya Path tracing, Bidirectional Path tracing**, and **Photon mapping** using **C++**.

C4 - A C COMPILER *2020*

- In a 3-member team, built a **basic compiler** for a C subset, integrating **SCCP analysis** and optimization in **LLVM IR** using **C++**.

HDR PROCESSING IN GPU *2020*

- Implemented **tone-mapping** for HDR images on LDR devices, decreasing processing time from **120 secs to 2 secs** using GPU with **C++, CUDA**

Honors & Awards

2018	**Winner,** AT Accessibility Hackathon	*Maker Valley*
2018	**Second Runner-Up,** Accessibility Hackathon	*Ford Foundation*
2018	**Winner,** Hack-A-Week (Gaming Catergory)	*LOCUS*
2014	**Fully Funded Academic Scholarship,** Insititue of Engineering, Tribhuvan University	*Goverment of Nepal*

Interests

Interests	Video Games, Modern Art, World History, Music, Animated Movies
Hobbies	Reading, Personal Projects, Planning, Designing, Digital Painting and Art