Wamiq Reyaz Para

linkedin.com/wamiq-reyaz
github.com/wamiq-reyaz

Email: wamiq.para@kaust.edu.sa
Mobile: +966-565639441
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Statement

I am a **graduated PhD candidate** from KAUST looking to transition from academia into industry and am seeking roles like Machine Learning/ Deep Learning Engineer or Scientist. I have **5+ years of experience** doing modern deep learning. The key part of my research was to use **NLP models**, mostly LLMs like **GPT2 and BERT** to perform tasks in other domains - graph generation and head avatar generation. I also researched **NeRF and differentiable rendering** and **semantic segmentation** methods. I have significant experience with modern Deep Learning frameworks and allied tools - **PyTorch, Tensorflow, numpy, pandas, Docker and WandB**. I have built significant amounts of software in the course of my research. This includes pipelines to process millions of images or graph data. And **writing fast loaders and pre-processing for large data**. In addition, I have experience setting up multi-node optimization pipelines. I also gained experience in computer graphics, optimization and wrote significant amount of **C++ and CUDA** code for graphics and geometry processing purposes.

Education

- **King Abdullah University of Science and Technology** — Thuwal, Saudi Arabia
  PhD - Computer Science — *May 2019 - Dec 2023*
- **King Abdullah University of Science and Technology** — Thuwal, Saudi Arabia
  MS - Computer Science; GPA: 3.82/4 — *Aug 2017 - May 2019*
- **National Institute of Technology** — Srinagar, India
  BTech - Electronics and Communication Engineering; GPA: 8.85/10 — *Aug 2013 - Jun 2017*

Publications

- **COFS: Controllable Furniture layout Synthesis** : **Wamiq Reyaz Para**, Paul Guerrero, Niloy Mitra, Peter Wonka (SIGGRAPH Conference, 2023)
- **SketchGen: Generating Constrained CAD Sketches** : **Wamiq Para**, Shariq Bhat, Paul Guerrero, Tom Kelly, Niloy Mitra, Leonidas J. Guibas, Peter Wonka (NeurIPS, 2021)
- **Generative Layout Modeling Using Constraint Graphs**: **Wamiq Para**, Paul Guerrero, Tom Kelly, Leonidas J. Guibas, Peter Wonka (ICCV, 2021)
- **Large Scale Architectural Asset Extraction from Panoramic Imagery**: Peihao Zhu, **Wamiq Reyaz Para**, Anna Fruehstueck, John Femiani, Peter Wonka (TVCG, 2020)

Pre-prints

- **Large-Scale Auto-Regressive Modeling Of Street Networks** : Michael Birsak, Tom Kelly, **Wamiq Para**, Peter Wonka (arxiv, 2022)
- **Facade Segmentation in the Wild** : John Femiani, **Wamiq Reyaz Para**, Niloy Mitra, Peter Wonka (arxiv, 2018)

Experience

- **Research Intern** — Huawei Research, London
  Head Avatars (Full Time) — *Feb 2023 - Present*
  - Supervised by Jiankeng Deng and Pradyumna Reddy
  - Working on modelling one-shot head avatars using the FLAME model.
  - Large-scale video processing and parametric head models.
  - Experience in setting up video and graphics pipelines - Differentiable Rendering, Mesh Processing.
  - Generation of avatars using image-conditioned Diffusion. Controllable generation by incorporating LLM based conditioning.
- **Research Intern** — UCL/Adobe Research, London
  Editable NeRF (Full Time) — *Aug 2022 - Nov 2022*
  - Supervised by Prof. Niloy Mitra and Paul Guerrero.
  - Working on making radiance fields editable with disentangled texture and geometry.
  - Application driven project to create neural textures that are transferable across geometries.
  - Experience in setting up deep-learning and graphics pipelines - Volume Rendering, NeRF, Mesh Processing.
- **Doctoral Researcher** — KAUST
  Layout Synthesis (Full Time) — *Aug 2019 - Present*
  - Supervised by Prof. Peter Wonka.
  - Working on deep-learning based methods to generate layouts. Currently working on generating indoor 3D layouts.
  - Proficient with large scale data parsing/processing and training on HPC clusters across multiple GPUs and nodes.
  - Experience in training multiple deep-learning models - Transformers, Graph-Convolutional Nets, GANs, VAEs.
- **Graduate Researcher** — KAUST
  Semantic Segmentation (Full Time) — *Jan 2017 - Aug 2019*
  - Supervised by Prof. Peter Wonka.

- Contributed an efficient factorized convolution which was specifically designed for rectified facades and a method to deal with multiple labels per-pixel.
- Modified the original SegNet code in Caffe. Wrote a DeepLab implementation in TensorFlow. Ported DeepLab to PyTorch.

- **International Institute of Information Technology** Hyderabad, India
  Research Intern (Full-time) *Dec 2015 - Feb 2016*
  - Worked under Prof. K Madhava Krishna and Harit Pandya at the Robotics Research Center, IIIT Hyderabad
  - Worked on pose estimation with an LDA based method.
  - Implemented, vectorized and benchmarked the method in MATLAB.

Skills Summary

- **Languages**: Python (Excellent), C/C++(Intermediate), MATLAB (Intermediate), JavaScript (Intermediate), CUDA (Intermediate), PHP (Basic), HTML (Basic)
- **Frameworks**: pytorch, tensorflow, numpy, opengl, scikit, scikit-learn, pandas, opencv, flask, threejs
- **Tools**: Docker, GIT, SLURM, LaTeX, Bash, AWS, GCP
- **Applications**: Inkscape, GIMP, Blender, Adobe Illustrator
- **Keywords**: NLP, Transformer, 3D, Rendering, Machine Learning

Projects

- **Geometry - Quad Mesh Offset Generator (Geometry, C++, Mesh, Geometric Modelling)**: Research oriented, open source, C++ application to generate offsets for Quad Meshes using Discrete Differential Geometry and the computation of the discrete curvature (Fall '20)
- **Distributed Templates for SLURM (Infrastructure, Systems, Computer Vision, Python)**: Codebase/Framework to help users get started up with the SLURM cluster at KAUST. Runs across multiple nodes/multiple CPUs. (Summer '19)
- **Face Editing with Vector Quantized Models(Generative Modeling, VAEs, Image Generation, Image Editing)**: Developed Face Editing tools based on two level Vector Quantized VAEs. Using a novel training strategy, effectively decoupled structure from texture (Fall '19 - Fall'20)
- **Annotator for 3D-Meshes (Tooling, 3D, Meshes, Python, C++)**: Developed an annotator for 3D meshes to help label the canonical orientation of certain 3D meshes. Reimplementation of *libigl* in Python. (Fall '21)
- **Rendering Scripting (3D-rendering, Blender, Python)**: A rendering framework for headless rendering on remote machines. (Spring '22)

Honors and Awards

- Top 1% of the All India Engineering Entrance Examination (AIEEE), amongst 1.3 million students - 2013
- Top 3 GPA in Undergraduate Degree - 2017
- Accepted to the very selective SIAM Summer School - 2020/21

References

All code available on request.

Peter Wonka
Professor, KAUST
Website
Email
Google Scholar

Helmut Pottmann
Professor, KAUST
Website
Email
Google Scholar

Niloy Mitra
Professor, UCL
Website
Email
Google Scholar

Paul Guerrero
Scientist, Adobe Research
Website
Email
Google Scholar