

# TAIMOOR TARIQ | Curriculum Vitae

✉ [tariqt@usi.ch](mailto:tariqt@usi.ch) • [Personal Webpage](#) • [Twitter](#) • [Google Scholar](#)

## ABOUT ME

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Scientist/Engineer interested in human vision and computer graphics. More specifically, I work on understanding, quantifying and maximizing perceptual realism and aesthetic quality (with constituents such as spatial quality, dynamic range, depth, motion and color) for real-time image/video capture (computational photography), synthesis (rendering/graphics) and display (computational display).

## EDUCATION

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### UNIVERSITÀ DELLA SVIZZERA ITALIANA (USI)

PhD in Computer Science

Concentration: Vision Science and Computer Graphics

Mentor: [Piotr Didyk](#)

2020 - 2024

Lugano, Switzerland

### KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

MS in Electrical Engineering

Concentration: Visual Computing and Machine Learning

CGPA: 4.0/4.3

[KAIST Graduate Fellowship Awardee](#)

2017 - 2019

Daejeon, South Korea

### NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY (NUST)

BS in Electrical Engineering

Concentration: Digital Systems and Signal Processing

CGPA: 3.83/4.0 (Top 3% of class)

[Merit Scholarship Awardee \(ranked 36th out of ~80,000 applicants for admission\)](#)

2013 - 2017

Islamabad, Pakistan

## EXPERIENCE

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### RESEARCH SCIENTIST INTERN

Meta [∞](#)

Mentors: [Alex Chapiro\\*](#), [Ajit Ninan](#), [Nathan Matsuda](#), [Douglas Lanman](#)

Worked with the Applied Perception Science and Display Systems Research teams on perceptually optimized computational display algorithms for real-time VR. Designed an ultra-fast automatic/adaptive tone mapper (that optimally maintains perceptual appearance of HDR content after mapping) for standalone VR displays.

10/2022 - 6/2023

Sunnyvale, California, USA

### DOCTORAL RESEARCHER

Perception, Display and Fabrication Group - USI

Mentor: [Piotr Didyk](#)

Under the mentorship of Piotr Didyk, I worked towards realizing the dream of real-time AR/VR that is perceptually indistinguishable from the visual world. After carefully understanding and investigating the many intricacies of human vision, I designed real-time rendering algorithms to preserve the perception of spatial realism, dynamic range, motion, and depth/distance in AR/VR.

2020 - 2024

Lugano, Switzerland

### GRADUATE RESEARCHER

Video and Image Computing Lab - KAIST

Mentor: [Munchurl Kim](#)

Worked on teaching neural networks to perceive image/video quality the same way humans do, with a specific focus on maximizing perceptual quality for Video Restoration/Enhancement.

2017 - 2019

Daejeon, South Korea

### UNDERGRADUATE RESEARCHER

2016 - 2017

Mentor: [Awais Kamboh](#)

Designed real-time unsupervised signal processing algorithms, and their corresponding digital architectures (using VHDL and FPGAs) for future implantable neural chips (primarily for neuro-prosthetics)

## RESEARCH INTERESTS

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Visual Perception, Computer Graphics, Computational Displays, Computational Photography, Augmented/Virtual Realities

## PUBLICATIONS

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Representative papers are highlighted

### **Towards Motion Metamers for Foveated Rendering**

SIGGRAPH 2024 [\[journal\]](#)

[Taimoor Tariq](#), Piotr Didyk

### **Perceptually Adaptive Real-Time Tone Mapping**

SIGGRAPH Asia 2023

[Taimoor Tariq](#), Nathan Matsuda, Eric Penner, Jerry Jia, Douglas Lanman, Ajit Ninan, Alexandre Chapiro

### **Noise-based Enhancement for Foveated Rendering**

SIGGRAPH 2022 [\[journal\]](#)

[Taimoor Tariq](#), Cara Tursun and Piotr Didyk

### **Why are Deep Representations Good Perceptual Quality Features?**

ECCV 2020

[Taimoor Tariq](#), Okan Tarhan Tursun, Munchurl Kim and Piotr Didyk

### **A HVS inspired Attention to Improve Loss Metrics for CNN-based Perception-Oriented Super-Resolution**

ICCV 2019 - Learning for Computational Imaging Workshop

[Taimoor Tariq](#), Juan Luis Gonzalez Bello and Munchurl Kim

### **Computationally Efficient Fully-Automatic Online Neural Spike Detection and Sorting in presence of Multi-Unit activity for Implantable Circuits**

Computer Methods and Programs in Biomedicine, 2019

[Taimoor Tariq](#), Muhammad Hashim Satti, Hamid Mehmood Kamboh, Maryam Saeed and Awais Mehmood Kamboh

### **Low SNR Neural Spike Detection using Scaled Energy Operators for Implantable Brain Circuits**

IEEE Engineering in Medicine and Biology Conference (EMBC 2017)

[Taimoor Tariq](#), Muhammad Hashim Satti, Maryam Saeed and Awais Mehmood Kamboh