TAIMOOR TARIQ | Curriculum Vitae

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About me

Scientist/Engineer interested in human visual perception and computer graphics. More specifically, I work on understanding, quantifying and maximizing PERCEIVED visual realism for capture (camera processing pipeline), synthesis (rendering/graphics pipeline) and display (computational display). The long term goals I aim to push towards are; to advance our fundamental understanding of human vision and cognition, and apply this understanding to enable real-time immersive display techniques (VR/AR) that are indistinguishable from the real-world

Education

UNIVERSITÀ DELLA SVIZZERA ITALIANA (USI)
2020 - 2024
PhD in Computer Science
Lugano, Switzerland
Concentration: Computer Graphics and Vision Science

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)
2017 - 2019
MS in Electrical Engineering
Daejeon, South Korea
Concentration: Visual Computing and Machine Learning
CGPA: 4.0/4.3
KAIST Graduate Fellowship Awardee

NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY (NUST)
2013 - 2017
BS in Electrical Engineering
Islamabad, Pakistan
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)

Experience

RESEARCH SCIENTIST INTERN
10/2022 - 6/2023
Meta (formerly Facebook)
Sunnyvale, California, USA
Mentors: Alex Chapiro*, Ajit Ninan, Nathan Matsuda, Douglas Lanman
Working with the Applied Perception Science and Display Systems Research teams at Facebook Reality Labs; on perceptually optimized computational display algorithms for real-time VR systems

DOCTORAL RESEARCHER
2020 - current
Perception, Display and Fabrication Group - USI
Lugano, Switzerland
Mentor: Piotr Didyk
Working on understanding human visual perception in immersive environments, and designing perceptually optimized rendering algorithms for real-time VR.

GRADUATE RESEARCHER
2017 - 2019
Video and Image Computing Lab - KAIST
Daejeon, South Korea
Mentor: Munchurl Kim
Worked on making neural networks aware of the intricacies of human visual perception, with a specific focus on maximizing image/video quality for CNN based Image Restoration/Enhancement.

UNDERGRADUATE RESEARCHER
2016 - 2017
Neuro-informatics Research Group - NUST SEECS
Islamabad, Pakistan

Mentor: Awais Kamboh
Designed real-time signal processing algorithms and their corresponding digital architectures for unsupervised neural implants

Research Interests

Visual Perception, Computer Graphics, Computational Displays, Computational Photography, Real-Time Rendering, Augmented/Virtual Realities

Teaching

Teaching Assistant: Computer Graphics (Fall 2020, Fall 2021, Fall 2023), USI-Lugano

Teaching Assistant: Computer Vision & Pattern Recognition (Spring 2021, Spring 2022)

Teaching Assistant: Image & Video Processing (Spring 2023), USI-Lugano

Publications

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?
European Conference on Computer Vision (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
International Conference on Computer Vision Workshops (ICCVW 2019)
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