TAIMOOR TARIQ | Curriculum Vitae

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About me

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

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

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

CAMERA ALGORITHMS SCIENTIST
2024 -
Apple
Cambridge, UK
Working full-time as a part of the Camera Algorithms Team at Apple, which is responsible for the design of image capture and processing/rendering algorithms that serve all Apple product cameras such as the iPhone and VisioPro.

RESEARCH SCIENTIST INTERN
10/2022 - 6/2023
Meta
Sunnyvale, California, USA
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.

DOCTORAL RESEARCHER
2020 - 2024
Perception, Display and Fabrication Group - USI
Lugano, Switzerland
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.

GRADUATE RESEARCHER
2017 - 2019
Video and Image Computing Lab - KAIST
Daejeon, South Korea

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.

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

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

PUBLICATIONS

Representative papers are highlighted

Towards Motion Metamers for Foveated Rendering
SIGGRAPH 2024 [journal] (14.04% Acceptance-Rate)
Taimoor Tariq, Piotr Didyk

Perceptually Adaptive Real-Time Tone Mapping
SIGGRAPH Asia 2023 (18.3% Acceptance-Rate)
Taimoor Tariq, Nathan Matsuda, Eric Penner, Jerry Jia, Douglas Lanman, Ajit Ninan, Alexandre Chapiro

Noise-based Enhancement for Foveated Rendering
SIGGRAPH 2022 [journal] (14.1% Acceptance-Rate)
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