

# Project Proposal

Spring 2024



*Semester  
Project*

## **IMAGE DEBLURRING**

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Prepared For

**DR. JUNAID AHMED BHATTI**

# About The Instructor

Dr. Junaid Ahmed received his B.E. degree in Telecommunications Engineering from Mehran University of Engineering and Technology, Jamshoro, Pakistan (2006-2010), and M.S. degree in Electrical and Electronics Engineering from Eastern Mediterranean University (EMU), North Cyprus, Turkey (2014-2015). He has received his Ph.D. degree in Non-Destructive Testing and Structural Health Monitoring from the University of Electronic Science and Technology, China (2016-2020). He is currently working as Assistant Professor in Computer Systems Engineering Department, Sukkur IBA University Pakistan. His current research interests include artificial intelligence, machine learning, wavelet processing; debond/delamination detection, quantitative non-destructive testing and evaluation, sparse representations, and low-rank matrix factorization.

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# Team **M**our Meet



**PROJECT  
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# PROJECT SUMMARY

**THE PROPOSED PROJECT FOCUSES ON ADDRESSING THE CHALLENGES OF IMAGE BLUR CAUSED BY VARIOUS FACTORS SUCH AS MOTION AND DEFOCUS. THE GOAL IS TO DEVELOP EFFECTIVE DEBLURRING TECHNIQUES USING MATLAB, A POWERFUL PLATFORM FOR IMAGE PROCESSING. THE PROJECT WILL EXPLORE METHODS FOR MOTION DEBLURRING, DEFOCUS DEBLURRING, AND KERNEL ESTIMATION, EMPLOYING BOTH TRADITIONAL APPROACHES AND MODERN DEEP LEARNING TECHNIQUES.**

# KEY COMPONENTS

**MOTION DEBLURRING: INVESTIGATE METHODS TO ESTIMATE AND MITIGATE THE EFFECTS OF MOTION BLUR CAUSED BY CAMERA MOVEMENT.**

**DEFOCUS DEBLURRING: DEVELOP TECHNIQUES TO HANDLE DEFOCUS BLUR, INCLUDING DEPTH ESTIMATION AND SPECIALIZED ALGORITHMS FOR DEFOCUS CORRECTION.**

**KERNEL ESTIMATION: ACCURATE ESTIMATION OF BLUR KERNELS IS CRUCIAL. EXPLORE BLIND DECONVOLUTION METHODS AND OTHER KERNEL ESTIMATION TECHNIQUES.**

**REGULARIZATION TECHNIQUES: IMPLEMENT REGULARIZATION METHODS TO ENHANCE DEBLURRING STABILITY AND REDUCE NOISE AMPLIFICATION.**

**DEEP LEARNING APPROACHES: INVESTIGATE THE APPLICATION OF CONVOLUTIONAL NEURAL NETWORKS (CNNs) FOR END-TO-END LEARNING AND DIRECT MAPPING FROM BLURRED TO SHARP IMAGES.**

**THE PROJECT AIMS TO CONTRIBUTE TO THE FIELD OF  
COMPUTER VISION AND IMAGE PROCESSING BY  
PROVIDING ROBUST SOLUTIONS FOR IMAGE  
DEBLURRING, WITH PRACTICAL APPLICATIONS IN  
PHOTOGRAPHY, MEDICAL IMAGING, AND VARIOUS  
OTHER DOMAINS.**