MUHAMMAD UMAIR MUKATI

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EDUCATION

Masters of Science (MS) Feb. 2015 - Present
M.S. Electrical-Electronics and Cyber Systems Engineering
School of Engineering and Natural Sciences
Istanbul Medipol University
CGPA: **3.74/4.00** (Exp. grad. date: **Jun. 2017**)

Bachelor of Engineering (BE) Jan. 2010 - Dec 2013
B.E. Industrial Electronics Engineering
Institute of Industrial Electronics Engineering
NED University of Engineering & Technology
Thesis title: DSP based Software Defined Radio for FM demodulation
Percentage: **84.45 %**, CGPA: **3.70/4.00**

EXPERIENCE

Computational Cameras and Vision Lab.
Istanbul Medipol University Feb. 2015 - Present
Research Assistant

- Conducting research on "Light Field Cameras" with **Dr. Bahadir Gunturk** on spatio-angular resolution enhancement, synthetic aperture, decoding raw data and depth estimation.
- Worked on other topics besides basic research including deep learning, 3D point cloud processing.

Computer Vision Application Developer Jun. 2016 - Present
Freelancer

- Working as freelancer doing projects on image processing related applications using MATLAB and OpenCV.
- Offering a range of services including image enhancement, segmentation, pattern recognition, neural network, classification, clustering etc.

College of Engineering
P.A.F. Karachi Institute of Economics & Technology Jan. 2014 - Jan. 2015
Teacher Assistant

- Conducted Linear Control Systems Lab.
- Conducted Microprocessor & Microcontroller Based Systems Lab.
- Developed hardware for Linear Control Systems Lab.

Electromechanica Jul. 2014 - Jan. 2015
Research & Development Engineer

- Designed and developed lab trainers for Control Systems course.

Embedded Systems Lab.
PAF. Karachi Institute of Economics & Technology Jan. 2014 - Aug. 2014
Research Assistant

- Worked with **Dr. Husain Parvez** and **Dr. Imran Naseem** to develop efficient algorithm for License Plate Recognition over FPGA.

RESEARCH INTEREST

Discipline: Computer Vision, Machine Learning
Focus area: Light Field Imaging, Computational Photography, Neural Network

PUBLICATIONS

JOURNAL PUBLICATION

[1] M Umair Mukati and Bahadir K Gunturk. Light field stitching for extended synthetic aperture. *arXiv preprint arXiv:1611.05003, submitted for review at IEEE Transactions on Computational Imaging.*, 2017.

CONFERENCE PUBLICATION

[1] M Umair Mukati and Bahadir K Gunturk. Light field registration: A multi-view geometry approach. In *2016 24th Signal Processing and Communication Application Conference (SIU)*, pages 1289–1292. IEEE, 2016.

[2] M Umair Mukati and Bahadir K Gunturk. Hybrid-sensor high resolution light field imaging. In *2017 25th Signal Processing and Communication Application Conference (SIU) (Accepted)*. IEEE, 2017.

[3] M Umair Mukati and Bahadir K Gunturk. Light field super-resolution through controlled micro-shifts of light field sensor. In *review process, submitted to ICCV*. IEEE, 2017.

ONLINE PUBLICATION

[1] Umair Mukati. Ulti-isp usb programmer for avr & 8051, 2013. The project is available at **Dangerous Prototypes**.

[2] Umair Mukati, Naveed Ahmed, and Sajid Hussain. Global positioning device, 2012. The project along with source code is uploaded at **Code Project**.

PROJECTS

HYBRID IMAGING
IMU CCV LAB

Combined a light field and a regular camera to enhance spatial resolution of light field image using dense optical flow estimation.

LIGHT FIELD STITCHING FOR EXTENDED SYNTHETIC APERTURE
IMU CCV LAB

By estimating 3D rotation and through feature matches, merged multiple light fields captured by a micro lens array based camera, and obtained larger synthetic aperture, which resulted in improvement in light field capabilities, such as increased depth estimation range/accuracy and wider perspective shift range.

LANE DETECTION
IMU CCV LAB

Developed lane detection algorithm for automatic vehicle navigation.

OTHER PROJECTS

- Number plate recognition using FPGA, PAF-KIET **(MS)**
- Software defined radio: decoding of FM signal using ARM, IIEE-NED **(BE)**
- USB FM device using AUDIO and HID class, IIEE-NED **(BE)**
- GPS/GSM based tracking device, IIEE-NED **(BE)**
- GSM based SMS server and its software implementation, IIEE-NED **(BE)**

GENERAL TEST SCORES

GRE:	307.5/346 (Quantitative: 164/170)	Sep. 10, 2014
TOEFL:	89/120	Jul. 15, 2016

TECHNICAL STRENGTHS

Computer Languages:	C, C++, Visual C#, HTML, PHP
Computational Software:	MATLAB, OpenCV
Modeling Software:	Cura for Ultimaker 3D printer, Google Sketchup, Eagle CAD
Embedded Platforms:	ARM, AVR, PIC, 8051, ST Microcontrollers, Raspberry PI, FPGA

AWARDS & ACHIEVEMENTS

1. Secured fully funded research assistant position for doing masters at Istanbul Medipol University, Istanbul, TR in 2015.
2. Offered fully funded scholarship with graduate teaching fellow position for doing masters leading to PhD at PAF-KIET, Karachi, PK in 2014.
3. Secured third position in all B.E. Industrial Electronics Engineering semesters and awarded merit scholarships for Bachelor studies in 2013.
4. Secured first place in 74xx Circuit Design international competition organized by Dangerous Prototypes, by making a digital calculator with complex functionalities, all using 7400 series digital ICs in 2012.
5. Got the idea for implementing a cheap USB based DAQ card solution accepted at PITB Plan9 Karachi Launchpad (Innovation Platform) in 2012.
6. Secured first prize in Circuit Design Contest organized by FAST National University in 2011.

ONLINE COURSES

Machine Learning Feb. 2016
Coursera, Stanford University
Offered by Andrew Ng
Certification earned with a grade of **96.5%**, LINK

Circuit & Electronics 6.002x Jun. 2012
EdX, Massachusetts Institute of Technology
Offered by Anant Agarwal
Certification earned with **A** grade, LINK

REFERENCES

Bahadir K. Gunturk Professor
Istanbul Medipol University
School of Engineering and Natural Sciences,
Kavacik Mah. Ekinciler Cad. No.19 Kavacik Kavsagi 34810 Beykoz Istanbul, Turkey
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PAF Karachi Institute of Economics & Technology
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