
# Muhammad Nasir Ullah

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**Office:** Department of Radiology, School of Medicine, Stanford University, 318 Campus Drive, Stanford, CA, USA, 94305-5427

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## Education

**Integrated MS + PhD in Bio-Convergence Engineering**
Molecular Imaging System Laboratory (MISL), Department of Bio-Convergence Engineering, Korea University, Seoul, South Korea
**Supervisor:** Prof. Yeom Jung Yeol

**Sep** 2015-**Feb** 2020
**Thesis Title:** "Detector Designs for Nuclear Medicine and Hybrid Ultrasound-Gamma Probe"
**Areas explored:** Time of Flight Positron Emission (ToF-PET) Detector Design. Gamma and Positron intra-operative probes detector design. Mixed radiation field signal discrimination and processing. Front end circuit for gamma and ultrasound system, FPGA and SoC-based data acquisition and processing systems.

**BS in Electronic Engineering**
Department of Electronic Engineering, International Islamic University, Islamabad, Pakistan
**Supervisor:** Engr. Khurram Hussain Pirzada

**Sep** 2008-**June** 2012
**Final Year Project:** "Dual Axis Solar Tracking and Sinusoidal Inverter"
**Areas explored:** Electronics, Embedded Systems

## Work Experience

3rd Jan 2021 – Current
**Postdoctoral Fellow**
Department of Radiology, School of Medicines, Stanford University, CA, USA
1st Mar 2020 – 30th Nov 2020
**Postdoctoral Fellow**
Department of Biomedical Engineering, School of Health Sciences, Korea University, Seoul, South Korea
1st Sep 2015 -- 25th Feb 2020
**Graduate Student**
Department of Biomedical Engineering, School of Health Sciences, Korea University, Seoul, South Korea

- Explored techniques for designing radiation detector and discrete front-end electronics. Have also worked on analog Signal processing circuitry design for various types of radiation measurement detectors.
- FPGA based data acquisition system design for radiation detectors and post signal processing of radiation signals.
- Ultrasound (US) single element probe, front and back end circuit design for medical purposes.
- Radiation Discrimination detector and system design
- Development of DOI-ToF-PET Detector Design

1st Sep 2014 – 31st Aug 2015
**Research Assistant**
Department of Biomedical Engineering, School of Health Sciences, Korea University, Seoul, South Korea

- Studied Radiological physics and circuit design methodologies for radiation detectors
- Worked on semiconductor and scintillator-based radiation detector circuit design

## Educational Skills

- Research Experience on FPGA Platforms
- Hands-on Experience with FPGA-SoC Kit

- Research Experience and Deep Understanding of Hybrid Multi-Modality Imaging Detector and System Design (Ultrasound/Gamma)
- Discrete Front-End Electronic Circuit Design for Radiation Measurement
- VHDL FPGA Coding and Signal Processing
- Teaching Skills

## Additional Information

### Publications SCI (E)

1. **Ullah MN**, Pratiwi E, Park JH, Yamamoto S, Kamada K, Yoshikawa A, Yeom JY. Studies on sub-millimeter LYSO: Ce, Ce: GAGG, and a new Ce: GFAG block detector for PET using digital silicon photomultiplier. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors, and Associated Equipment. 2018 Dec 11; 911:115-22
2. **Ullah MN,** Pratiwi E, Cheon J, Choi H, Yeom JY. Instrumentation for time-of-flight positron emission tomography. Nuclear medicine and molecular imaging. 2016 Jun 1;50(2):112-22.
3. **Ullah MN**, Park C, Pratiwi E, Kim C, Choi H, Yeom JY. A new positron-gamma discriminating phoswich detector based on wavelength discrimination (WLD). Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment. 2019 Aug 26:162631.
4. **Ullah MN**, Pratiwi E, Park JH, Lee K, Choi H, Yeom JY. Wavelength discrimination (WLD) TOF-PET detector with DOI information. Physics in Medicine & Biology. 2020 Feb 28;65(5):055003.
5. **Ullah MN**, Park JH, Pratiwi E, Kim GB, Yeom JY. Wavelength discrimination (WLD) detector optimization for time-of-flight positron emission tomography with depth of interaction information. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment. 2020 Dec 1; 982:164498.
6. Park C, **Ullah MN**, Kim C, Cho S, Yeom JY. Investigation of optical properties of ceramic Ce: GAGG by high temperature annealing. Journal of the Korean Physical Society. 2019 Dec;75(12):962-7.
7. Pratiwi E, Bae S, Lee H, **Ullah MN**, Lee B, Lee K, Yeom J. Collimators for Gamma Dual Energy CT Arch-Detector: A Simulation Study. Journal of the Korean Physical Society. 2020 Jan;76(1):79-85.
8. **Ullah M.N**, Park Y, Kim G.B, Kim C, Park C, Choi H, Yeom J.Y, Simultaneous Acquisition of Ultrasound and Gamma Signals with a Single-Channel Readout. *Sensors* **2021**, *21*, x.

### Under Review/Preparing for Submission

9. **Ullah MN** and Yeom JY, "FPGA base NIR/Gamma Hybrid Probe". (Physics in medicine and Biology) (Writing stage).
10. **Ullah MN** and Yeom JY, "SIPM optimization and Temperature compensation for intra-operative mini-gamma probe", (Nuclear Engineering and Technology). (Writing stage).
11. **Ullah MN**, Kim B, Park Y and Yeom JY*. Pulse shape discrimination-based signal multiplexing of Silicon Photomultiplier (SiPM) array. (Data Analysis and writing stage).

### Patents

- Phoswich Detector Design for mixed radiation signal Discrimination using wavelength Discrimination (WLD) (Korean Patent)
- Ultrasound/Nuclear Medicine Probe Design for medical purpose. (Korean Patent)
- DOI capable ToF-PET detector based on emission wavelength of scintillator. (Korean Patent)
- Pulse Shape and Deep Learning Based Signal Multiplexing for Nuclear Medicine Detector. (Korean Patent
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### Conferences

- IEEE NSS/MIC 2020, Boston, USA (online)
- SORMA 2018 Michigan, USA
- IEEE NSS/MIC 2018, Sydney, Australia
- IEEE NSS/MIC 2017, Atlanta, USA
- IEEE NSS/MIC 2016, Strasburg, France

### Honors and Awards

- IEEE NSS/MIC Trainee Grant (2020)
- Departmental best paper Award, Korea University (2020)
- IEEE NSS/MIC Trainee Grant (2016)
- Professor Scholarship for Ph.D. Studies at Korea University Seoul, South Korea (2015)
- Professor Scholarship for Integrated Ph.D. Studies at Kumoh National University Gumi, South Korea (2014)
- 3rd Prize, Final Year Project, International Islamic University Islamabad, Pakistan (2012)

### References


- **Jung-Yeol Yeom, PhD**
  Associate Professor

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- **Kisung Lee**
  Professor

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Office: +82-2-3290-565

## Declaration

I, Muhammad Nasir Ullah, hereby declare that the information contained herein is true and correct to the best of my knowledge and belief.

Muhammad Nasirullah

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Muhammad Nasir Ullah

CA, USA
Jan 30, 2021