

I have a strong background in computational imaging, inverse problems, numerical optimization, and signal processing with applications in mm-waves (radar) and X-ray CT.

## EDUCATION

### **Ph.D Computer Engineering, (*Expected June 2021*)**

Boston University, MA - Advised by Prof. David Castañón (GPA : 3.93/4)

Thesis : Enhanced Reconstruction and Material Recognition in X-ray CT for Security Applications

### **Masters in Electrical Engineering (*2017*)**

University of Washington, Seattle, WA- Advised by Prof. Matthew S. Reynolds (GPA : 3.88/4)

Thesis : Computational Imaging for Dynamic Metasurface based Synthetic Aperture Radars

### **Bsc Engineering (Electronics and Telecommunication) (*2014*)**

University of Moratuwa, Sri Lanka, (GPA : 3.97/4.2)

## WORK EXPERIENCE

### **Lawrence Livermore National Laboratory, CA - Computational Engineering Intern (*2020 September-December*)**

I modeled and implemented a reconstruction algorithm to jointly image material properties with non destructive X-ray CT which reduced the bias compared to the current system.

### **Alcatel-Lucent, Sri Lanka -Engineering Trainee (*2012 June-November*)**

Created a web-based database to facilitate the mobile network maintenance and repair tasks of client operators.

## RESEARCH HIGHLIGHTS

### **Accelerated 3D millimeter wave image reconstruction with enhanced resolution**

Synthetic Aperture Radar (SAR) image reconstruction is a computationally complex, ill conditioned inverse problem. I proposed a GPU-accelerated, robust algorithm for 3D mm-wave imaging and a novel SAR imaging mode for enhanced resolution with dynamic meta-material antennas.

### **Metal artifact reduction in X-ray computed tomography for material recognition**

X-ray CT offers the potential for accurate material characterization, but is limited by the presence of highly dense materials like metal. I have proposed and implemented advanced regularization techniques to reduce noise and metal artifacts in baggage screening and have proposed novel methods for better material characterization based on multi-spectral CT.

### **3-D X-ray CT reconstructions for cargo systems**

High resolution 3-D cargo image reconstructions involve lots of data but still needs accelerated reconstructions. I have modeled and implemented numerical optimization algorithms for efficient reconstruction of large scale 3D X-ray CT cargo screening.

### **Application of deep-learning for enhanced focusing in limited angle cone-beam CT**

Limited view sensing geometries are increasingly used because of lower costs and lower dosage, but the incomplete data can lead to scanner-dependent distortions. I have demonstrated that a trained neural network can be used to correct such artifacts.

## SELECTED AWARDS

IMS 2017 Three Minute Thesis Competition 3<sup>rd</sup> Place - Organized by IEEE International Microwave Symposium (IMS) 2017

LSS Award - Leadership, Scholarship and Service Award for the most outstanding student in the department in 2014; awarded by University of Moratuwa

Distinguished Electrical Engineering Fellowship from Boston University (2017)

Grace Hopper Conference Student Scholarship - Awarded by Anita Borg Institute (2017)

Selected to participate in Grad Cohort Workshop CRA-W, 2018

PATENTS	“Millimeter Wave and/or Microwave Imaging Systems and Methods Including Examples of Partitioned Inverse and Enhanced Resolution Modes and Imaging Devices”, WO2018147929A2
JOURNAL PUBLICATIONS	S.Devadithya, A. Pedross-Engel, C.M.Watts and M.S. Reynolds, “GPU Accelerated Enhanced Resolution 3D SAR Imaging with Dynamic Metasurface Antennas”, <i>IEEE Transactions on Microwave Theory and Techniques</i> , vol. 65, no. 12, pp. 5096 - 5103, Dec. 2017.
CONFERENCE PUBLICATIONS	S.Devadithya, D.Castañón, “Enhanced Material Estimation with Multi-Spectral CT”, <i>IS&amp;T Electronic Imaging/Computational Imaging XIX conference</i> , January 2021.
	S.Devadithya, D.Castañón, “Material Identification in the Presence of Metal for Baggage Screening”, <i>IS&amp;T Electronic Imaging/Computational Imaging XVIII conference</i> , January 2020.
	S.Devadithya, D.Castañón, “Edge-preserving Total Variation Regularization for Dual-Energy CT Images”, <i>IS&amp;T Electronic Imaging/Computational Imaging XVII conference</i> , January 2019.
	S.Devadithya, A. Pedross-Engel, C.M.Watts and M.S. Reynolds, “GPU Accelerated Partitioned Reconstruction Algorithm for Millimeter-Wave 3D Synthetic Aperture Radar (SAR) Images”, <i>International Microwave Symposium (IMS)</i> , June 2017.
	S.Devadithya, A. Pedross-Engel, C.M.Watts and M.S. Reynolds, “Partitioned Inverse Image Reconstruction for Millimeter-wave SAR Imaging”, <i>IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)</i> , March 2017.
	T. Adikari, S.Devadithya, S. Bandara, C. Dharmawardana and C. Wevegedara, “Application of Automatic Speaker Verification Techniques for Forensic Evidence Evaluation”, <i>International Conference on Digital Signal Processing (DSP)</i> , August 2014.
TEACHING EXPERIENCE	<p><b>Boston University ,MA</b> Teaching Assistant - Computational Linear Algebra (Spring 2019 &amp; Fall 2019)</p> <p><b>University of Washington, WA</b> Teaching Assistant - Discrete Time Linear Systems, Modern Wireless Communications, Introduction to Electrical Engineering.</p> <p><b>University of Moratuwa, Sri Lanka</b> Teaching Assistant - Signals and Systems, Communications III, Introduction to Telecommunication. Coordinator - Monthly Research Seminar</p>
LEADERSHIP AND VOLUNTEERING	<p><b>Boston University,MA</b> Founding president of Electrical and Computer Engineering Graduate Students Association Currently acts as a one-on-one mentor for Electrical and Computer Engineering PhD students and Women in Science and Engineering undergraduate students.</p> <p><b>University of Moratuwa, Sri Lanka</b> Held the posts of Director of Public Relations and Editor in Rotaract Club and won local and international awards. Student representative in the senior year (of 100 students).</p>