I have worked on modeling and simulation of Positron Emission Mammography based on solid state detectors for my PhD thesis. My main research is on detector simulation and image reconstruction. I have worked on several different fields of science such as high energy physics, solid-state physics, and medical imaging. Also, I have worked on fabrication and characterization of semiconductor thin films, including fabrication and analysis of diodes, LEDs, and transistors for the beginning of my PhD studies. I have been to Frederick Seitz Materials Research Laboratory at the University of Illinois at Urbana-Champaign, Illinois, USA to work on growth of carbon nanotubes in 2009 summer.

From 2011 to 2012, I have been at IFAE (Institut de Fisicad'Altes Energies – Institute of High Energy Physics) in Barcelona, Spain, to gain experience in the field of medical imaging. I have been involved in a project that was called as voxel imaging PET (VIP) pathfinder and it was supported by the European Research Council (ERC). I worked in a multidisciplinary environment on topics related to medical imaging. These topics included modeling, simulation and image reconstruction of solid state pixelated semiconductor detectors to be used in Positron Emission Tomography (PET), Positron Emission Mammography (PEM), and Compton Camera (CC). I have gained extensive experience in medical imaging devices by being involved in a unique project to build a novel imaging devices based on pixelated solid state detectors. In addition, I have learned about image reconstruction techniques. Upon return to my country of origin, I continued working as a research assistant and made contribution in development of medical imaging science in my home country. I have completed my PhD studies and defended my thesis in 2014 in Turkey.

I have mastered a Geant-4 based simulation toolkit to simulate and evaluate the performance of the proposed detectors. Also, I have used several image reconstruction algorithms such as Filtered Back-Projection, Ordered-Subsets Expectation Maximization to reconstruct high quality imagesfrom the simulation results. I have joined several international conferences including IEEENuclear Science Symposium and Medical Imaging Conference which is the largest conference in the field of medical imaging.

I have worked as a research assistant for six years in the Physics Department at Cukurova University in Adana, Turkey. In addition to my research efforts, I was helping undergraduate students with physics and calculus problems. I was also helping them doing physics experimentsat laboratories at the Cukurova University that included mechanics, electricity, electronics, thermodynamics and quantum physics.

After earning my PhD, I won the International Postdoctoral Research Scholarship from The Scientific and Technological Research Council of Turkey (TUBITAK) for Harvard Medical School (HMS) and Massachusetts General Hospital (MGH) for 2015-2016. Then, I was supported by HMS and MGH for my further postdoctoral studies 2016-2017.

Currently, as a faculty in the Department of Biomedical Engineering at Near East University, I am working on investigating the effects of general anesthesia on small animal brain with a novel functional imaging paradigm, which I started and contributed at HMS and MGH, as well as understanding the mechanism of general anesthesia which is one of the biggest mysteries of modern medicine. In this sense, I am working on a system that enables to image small animals while they are awake during a PET scan without compromising the image quality. I am also working on a novel motion correction technique for patients undergoing PET scans.