Intelligent Solutions for Navigating the Big Data from the Arctic and Antarctic

Maryam Rahnemoonfar

Computer Vision and Remote Sensing Laboratory, School of Engineering and Computing Sciences, Texas A&M University-Corpus Christi

Navigating the New Arctic and harnessing the data revolution are two of the "NSF's 10 Big Ideas" unveiled in 2016. These are long-term, cutting-edge research ideas that identify areas for future investment at the frontiers of science and engineering. In this presentation, I will speak about my research at the intersection of these two areas.

The Intergovernmental Panel on Climate Change (IPCC) estimates that the global sea level could increase by 26–98cm by the end of this century. This large range of predicted sea level rise can be partially attributed to an incomplete understanding of bed topography and basal conditions in fast-flowing regions of ice sheets in Greenland and Antarctica. Although significant resources have been spent in collecting and storing large and heterogeneous datasets during expensive Arctic and Antarctic fieldwork, the analysis of these big data sets still stands as a great challenge due to the complexity, scale, and multidisciplinary nature of the data.

Radar sensors are one of main the instruments that can penetrate through ice and give information about the hidden subglacial topography over large areas. In this presentation, I will explain the current challenges of big and complex radar airborne datasets and some of our solutions for tackling those issues. I will then briefly describe the challenges and opportunities for big data perception with and beyond the visible spectrum in our other projects.

Short Bio: Maryam Rahnemoonfar is an Assistant Professor of Computer Science in the School of Engineering and Computing Sciences at Texas A&M University-Corpus Christi (TAMUCC). She is the director of the Computer Vision and Remote Sensing Laboratory (Bina Lab) at TAMUCC. She is also the president and founder of the Corpus Christi Women in Machine Learning and Data Science (WiMLDS) chapter and the ambassador of Women in Data Science (WiDS) at Stanford University. Her research interests include Computer Vision, Machine Learning, Data Science and Remote Sensing. Her research has been funded by grants from NSF, Amazon, Texas Comprehensive Research Funds and Texas A&M University-Corpus Christi.

Before joining TAMUCC, she was a visiting scholar in the Data to Insight Center, Indiana University (2012-2013) and Assistant Professor in the School of Engineering, Isfahan University (2011-2012). She received her Ph.D. degree in Computer Science from the University of Salford, Manchester, UK in 2010, her M.Sc. degree in Remote Sensing Engineering from the University of Tehran in 2005 and her B.Sc. degree in Civil Engineering from the University of Isfahan in 2002.