Annexure

Brief Profiles of Faculty Members

Dr. Mrinal Das works in the area of building Bayesian models for rare observations in various domains starting from computer code to fashion. He also works in the area of building scalable learning algorithms for hierarchical Bayesian models. He is actively working in privacy aware learning. He has done a PhD at Indian Institute of Science (IISc) Bangalore and was a postdoctoral fellow at Aalto University, Finland and UMass Amherst USA before joining as Assistant Professor in Computer Science and Engineering department at IIT Palakkad. He has published in top notch venues in ML such ICML(2), AAAI, ICDM, CIKM, WSDM. He is supervising one PhD and one MS student in the area of ML. He has received SERB startup research grant in 2019 to work in ML. He can teach core and elective courses related to data science along with supervising projects.

Dr. Sahely Bhadra works in the broad area of Machine Learning (ML) and Optimization. More specifically, she is interested in multi view kernel learning from noisy incomplete data with structural properties. She has done a PhD at Indian Institute of Science (IISc) Bangalore with IBM Ph.D. Fellowship Award 2010 - 2011. She was a postdoctoral fellow at Max-Planck Institute of informatics Germany, Aalto University, Finland and Northeastern University USA before joining as Assistant Professor in Computer Science and Engineering department at IIT Palakkad. She has been awarded IMPECS postdoc fellowship, 2012-2014. Dr. Sahely has published in top venues in ML and bioinformatics such ICML(2),JMLR, MLJ, ICDM, Bioinformatics. She is supervising one PhD and one MS student in the area of ML in IIT Palakkad and jointly supervising one PhD student in Aalto University. She has received Indo-Finish Mobily Grand 2019 to visit in Aalto University, Finland. She can teach core and elective courses related to data science along with supervising research students.

Dr. Chandrashekar Lakshminarayana works in the areas of artificial intelligence, reinforcement learning, stochastic control and deep learning. He is interested in applications of AI to solve problems in education, transportation and weather forecasting. He is currently involved in a project titled “Paradigms, Interpretable Models and Algorithms for AI-based Human in the Loop Learning” funded by RBCDSAI (IITM). He obtained his PhD from the Department of Computer Science and Automation, Indian Institute of Science (2016), and was a postdoctoral research fellow at the Department of Computing Science (July 2016- June 2017), University of Alberta, and a research scientist at DeepMind, London (August 2017-July 2018). Prior to his PhD, he was an analog design engineer at Cosmic Circuits, Bangalore for a period of 3 years. He joined IITPKD as an assistant professor on July 2018. He has published in top tier journals such as IEEE Transactions on Automatic Control, Automatica, and top tier conferences such as AISTATS, AAAI and CDC. He can teach core courses and labs in data science, and guide students.

Dr Ashok Kumar works in the broad area of information theory and mathematical statistics. In information theory, the role of information measures in physical problems such as guessing, source coding, tasks partitioning, and so on. In statistics, solving robust inference problems via distance functions. He obtained his PhD from the Indian Institute of Science, Bangalore and did his post-doc at the Technion-Israel Institute of Technology. His works are published in journals such as IEEE Transactions on Information Theory, Entropy and conferences such as ISIT, NCC, ICORS. He is currently supervising two PhD students, one on minimum distance methods and another on large deviations theory. He received the VAJRA faculty award from SERB jointly with Prof Michel Broniatowski in 2018.

Dr. Lakshmi Narasimhan works in the broad area of statistical data processing, inference, data communication, and information theory. He graduated from the Indian Institute of Science, Bangalore, with MS and PhD in signal processing and wireless communications. He did his postdoc in Syracuse University, New York. He has also obtained the INSPIRE faculty fellowship. He has also worked in Cisco systems and National Instruments. His areas of research include algorithms and theory for distributed statistical inference, sparse data processing, and large wireless data networks.

Dr. Satyajit Das works in the areas of security, energy efficient architectures for near sensor data analytics, and AI on edge. He received his joint PhD degree in 2019 from the University of South Brittany (UBS), France, and University of Bologna (UniBo), Italy. Prior to joining IIT Palakkad, he was a postdoctoral fellow at the LabSTICC, UBS. He received UBS Presidential Doctoral Fellowship in 2014 and Fellowship from HiPEAC, Europe division in 2016 while he was working at the University of Bologna, Italy. Currently, he is closely associated with UniBo, Italy, and UBS, France. He has published several papers on energy efficient near sensor data analytics and Bio-Signal data analytics onto multi-core specialized accelerators. He has proposed several schemes to reduce the compute intensive workload of the AI applications in real time systems from the point of view of algorithmic level, architectural level, and compiler level. This wide spectrum of research combination led to designing of an open source ultra low power accelerator for embedded near sensor data analytics and AI applications named Integrated Programmable Array (IPA). Most of Dr. Das's works have been published in top tier conferences like DATE, ASPDAC, ISCAS, ISVLSI etc. His recent research development collaborated with the UniBo and UBS proposes transprecision implementations for some classical AI algorithms (e.g. PCA, SVM, CNN) for ultra low power execution of the applications onto IoT devices. He has established a close association with the Tampere University, Finland, where he is extending his collaboration with joint research project proposals.

Dr. Vivek Chaturvedi works in the area of Cyber Security, Reliability and Energy Efficiency in Cyber Physical Embedded Systems. Dr. Chaturvedi received his MS in Electrical Engineering from Syracuse University, New York in 2008 and PhD in Electrical Engineering from Florida International University, Miami, USA in 2013. Before joining Indian Institute of Technology Palakkad in 2018, he was working as a Research Scientist in the School of Computer Science and Engineering at Nanyang Technological University (NTU), Singapore. Dr. Chaturvedi has published over 25 papers in highly competitive Journals and Conferences such as ACM TECS, IEEE

TII, TVLSI, TCAD, DAC, DATE, ISLPED. Currently, he is working on cyber security projects in collaboration with Cyber Security Research Center (CYSREN), NTU Singapore and Embedded Systems Group at the Vienna University of Technology (TU Wien).

Dr. Jobin Francis works in the area of cellular communication, specifically, in the design and optimization of 5G and beyond cellular networks. He received his PhD from the Indian Institute of Science, Bangalore. He was a postdoctoral fellow at TU, Dresden, Germany, prior to joining IIT Palakkad. He has published in reputed journals such as Transactions on Communications and Transactions on Wireless Communications. His specific research interests include radio resource management, adaptive transmission with imperfect data, and stochastic geometry. He has recently started applying machine learning tools to improve the performance of cellular networks. He can offer elective courses related to statistical signal processing and supervise MTech projects.

Dr. B. K. Bhavathrathan works in the area of Transportation Systems focusing on road networks, traffic flow, accident analysis, etc. Before joining IIT Palakkad, he served as a Postdoctoral Associate in the Future Urban Mobility research group at the Singapore-MIT Alliance for Research and Technology, where he was involved in developing models for a comprehensive urban transportation simulation platform. He holds a Ph.D. in Transportation Systems Engineering from the Indian Institute of Technology Bombay. He has published works that employ techniques of optimization, game-theory, data-analysis etc. in problems related to disruption-prone urban road networks, traffic safety, urban freight delivery etc. For a project funded by the Ministry of Environment, Forest and Climate Change, he is currently studying vulnerable road network in Himalayan region to prescribe evacuation strategies, in collaboration with IIT Ropar and IIT Delhi.

Dr. Sarmistha Singh is a hydro-climatologist in Civil Engineering Discipline at IIT Palakkad. She received her Doctoral degree in Biosystems Engineering along with a Minor degree in Statistics from Auburn University, USA. She worked as a Postdoctoral Associate in the Department of Earth, Atmospheric and Planetary Sciences at Purdue University, USA. Her research deals with the spatio-temporal teleconnections of large scale ocean-atmospheric interactions with the hydrologic cycle. Her work integrates historic observations and remote sensing products within a simulation/statistical modelling framework to address problems related to water resources in India. Her research also focuses on the development of forecast tools using various machine learning techniques for different components of the hydrologic cycle. Her interests also include exploring/proposing sophisticated statistical techniques for analysis of experimental and time series datasets, develop environmentally sustainable watershed management strategies, and expand eco-hydrological research. Her publications are in well-known water resources journals like Water Resources Research and Journal of Hydrology. Recently, she received SERB startup research grant to study the hydroclimatic extremes in India. She can teach elective courses and supervise MTech projects related to large data management and machine learning techniques.

Dr. Subhasis Mitra focuses on the practical issues related to climate, water and agriculture. He received his doctoral degree in Biosystems Engineering at Auburn University, USA. He worked as a postdoctoral research associate at Auburn University. His research lies in the area of hydrologic forecasting for efficient planning and management of water resources. He uses a suite of hydrologic models, large climate forecast data and ML techniques for forecasting of water resources in India. He has published his research in well known water resources journals. He has received a research grant from KSCSTE that deals with climate change impacts of droughts in Kerala. He can teach elective courses related to spatio-temporal data management and engineering and supervise M.Tech research projects.

Dr. Reenu is a speech scientist (phonetician) in the Humanities and Social Sciences department at IIT Palakkad. After an undergraduate degree in English literature, she pursued an MA in Applied Linguistics from the University of York (U.K.) and obtained a PhD in Linguistics from Newcastle University (U.K.). She was awarded the Dr. S. Radhakrishnan UGC Post-Doctoral Fellowship in the Humanities and Social Sciences (2015-2018) which she took up at the Centre for Linguistics, JNU. She joined IIT Palakkad as Assistant Professor in July 2018. Her areas of research include experimental phonetics, sociophonetics, language acquisition, etc.

Given the relevance of the relationship between articulation and acoustics and acoustics and speech perception to automated speech synthesis and speech recognition respectively, it is important to address the significant gaps in the current approaches to speech synthesis and speech recognition that do not adequately take into account speech science tools, theories and techniques. Speech diversity also poses a serious challenge to existing AI platforms and the vast and varied Indian linguistic milieu offers the perfect platform to further innovative inclusive research in this area. It is in this broad interdisciplinary research space that she would like to work on with colleagues in AI and DS. She can teach elective courses related to acoustic analyses of speech data and language variation and change.

Dr. Amrita Roy has received PhD in Economics from Jawaharlal Nehru University, New Delhi and was an Institute Postdoctoral Fellow at IIT Kanpur. She has worked as Assistant Professor in Economics in Midnapore College (Autonomous), West Bengal before joining as Assistant Professor in Humanities and Social Sciences at IIT Palakkad. She was awarded the Ford Foundation fellowship, UGC-Net-JRF and Dr. S. Radhakrishnan UGC Post-Doctoral Fellowship in the Humanities and Social Sciences. She works in the broad area of development and growth economics. Her research interest lies in understanding the inter-linkages of different production activities such as agriculture, industry and services in an economy. Using disaggregated data at the micro and macro level she wants to analyse how the relationship between these different sectors changes as the economy develops. She can teach elective courses related to analysing and understanding hypothetical relationships using data.

Dr. Samarjeet Chanda earned his PhD from the Department of Mechanical Engineering at IIT Madras and subsequently worked as a post doctoral fellow at IIT Kanpur before joining as an Assistant Professor in the Discipline of Mechanical Engineering at IIT Palakkad. His primary research interests lie in the field of thermal and fluid sciences and engineering. He has applied data science techniques to solve inverse problems in the mentioned field of research. In this regard, he has worked in close association with U R Rao Satellite Center, ISRO, Bangalore and Oil and Natural Gas Corporation of India. He looks forward to further apply data science and machine learning techniques to solve problems focussing on different aspects of fluid flow and heat transfer.

Dr. Amit Kumar Pal works in the broad area of Quantum Information Science, Open Quantum Systems, and their interfaces with Quantum Many-Body Physics. He has done Ph.D at Bose Institute, Kolkata, and was a postdoctoral fellow at Harish-Chandra Research Institute (HRI), Prayagraj (Allahabad), Swansea University, UK, and University of Warsaw, Poland. before joining as Assistant Professor in Physics at IIT Palakkad. He has published in reputed international journals such as Physical Review A, New Journal of Physics, and Europhysics Letters. He is currently working with collaborators from the HRI, Allahabbad, RWTH Achen University, Germany, and University of Warsaw, Poland. Machine learning algorithms are now being used to develop efficient neural-network decoders for large quantum codes, particularly in large topological quantum codes. Also, data analysis and data science is being exploited to its fullest extent in estimating phases of quantum many-body systems, detecting phase transitions, and developing indicators for such transitions in the form of order parameters, which, together with the application in quantum computation domain, constitute Dr. Pal's research interest. He can teach elective courses related to the scope of applying machine learning techniques and data science in quantum problems related to quantum information science and quantum many-body physics, along with supervising projects.

Dr. Projjwal Banerjee works in the area of theoretical and computational nuclear astrophysics. He earned his PhD in 2011 from the University of Minnesota, Minneapolis, USA. Following that, he was a postdoctoral researcher at the University of California, Berkeley, USA (2011-2014), University of Minnesota, Minneapolis, USA (2014-2016), and Shanghai Jiao Tong University, China (2016-2019), before joining Indian Institute of Technology, Palakkad. He is currently working with collaborators from the University of Minnesota, Minneapolis, USA; Institute of Physics, Monash University, Victoria, Australia; Institute of Physics, Academia Sinica, Taiwan; Shanghai Astronomical Observatory, Shanghai, China; Los Alamos National Laboratory, New Mexico, USA; Institute of Modern Physics, Lanzhou, China. One of the fundamental goals in Astronomy is to understand the details of how our Milky Way galaxy was formed. Banerjee and collaborators have developed a new method based on machine learning that aims to reconstruct the assembly history of Milky using astrometric information of stars from large surveys from space based telescopes such as *Gaia* combined with spectroscopic data collected from large terrestrial telescopes. With several current as well as future planned surveys, Banerjee and collaborators plan to apply machine learning methods to vast amount of precision data to know more about the origins of our Galaxy.

Dr. Vishwas V works in the field of material science, using theoretical and computational statistical physics tools. After obtaining a PhD from the Theoretical Sciences Unit, JNCASR, Bangalore, he did his postdoctoral fellowships at the Institute for Building Materials, ETH, Zurich, Dept. of Physics, Georgetown University, Washington DC and the Laboratory for Interdisciplinary Physics, Univ. of Grenoble, Grenoble. Currently he is an Asst. Prof. at the Physics Dept., IIT Palakkad. His works on understanding the phase behavior of metastable liquid silicon (Nat. Phys. 2011) as well as microscopic mechanisms associated with rheology of amorphous solids (PRL 2017), which are inherently multi-variable problems (involving changes in pressure, temperature, interactions, shear rate, amplitude etc.), has enabled him to work in big data projects, in the domain of physical sciences and material science. He is currently working in an industrial collaborative project with the Georgetown University, Washington DC, USA and a fundamental research project with the University of Grenoble, France. His current research interests, related to bio-inspired material designs and understanding of structure-functionality relationship, requires cohesion of insights from machine learning and data mining tools with the physical understanding. He has a keen interest in applying statistical physics models to understand the Indian language and dialect maps. He can teach elective courses as well as supervise projects related computational statistical physics and rheology.
