



AFFECTIVE COMPUTING

PROF. JAINENDRA SHUKLA

Department of Computer Science and Engineering
IIIT Delhi

PROF. ABHINAV DHAL

Department of Computer Science and Engineering
IIT Ropar

PRE-REQUISITES : Mandatory Prerequisites: Programming Artificial Intelligence Machine Learning Desirable Prerequisites:
Human-Computer Interaction Deep Learning

INTENDED AUDIENCE : Senior UG and PG Students

INDUSTRY SUPPORT : In general, any company industry working with AI/ML will recognize this course. Some examples include: Amazon Apple Google Meta Microsoft

COURSE OUTLINE :

Affective Computing focuses on enabling the machines with emotion recognition and adaptive interaction. It lies in the intersection of Computer Science, design and human psychology. This course will overview the emotion theory, computational modelling of emotions, analysis of emotions using different modalities (such as voice, facial expressions, physiological signals etc) and related machine learning and/or signal processing techniques. We will also discuss ethical, legal and social implications of affective computing particularly in relation to Human-Machine Interaction.

ABOUT INSTRUCTOR :

Prof. Jainendra Shukla is the founder and director of the Human-Machine Interaction research group and is an Assistant Professor at the Department of Computer Science and Engineering in joint affiliation with the Department of Human-Centered Design IIIT-Delhi. He is heading the Centre for Design and New Media and is associated with Infosys Centre for Artificial Intelligence. He enthusiastically investigates how empowering social robots and machines with adaptive interaction abilities can improve the quality of life in health and social care. His research has been disseminated in several journals and conferences of international reputation, including CHI, IMWUT, and IEEE Transactions on Affective Computing. He is an active reviewer for several reputed conferences and journals in the field. He has been awarded the startup research grant by SERB, DST, and the research excellence award at IIIT-Delhi. He is the recipient of the prestigious Industrial Doctorate research grant by the Government of Spain in 2014. He received a B.E. degree in Information Technology from the University of Mumbai in First Class with Distinction in 2009. He pursued his M.Tech. Degree in Information Technology with a Specialization in Robotics from the Indian Institute of Information Technology, Allahabad (IIIT-A) in 2012. He received his Ph.D. in excellent grades with Industrial Doctorate Distinction and International Doctorate Distinction from Universitat Rovira I Virgili (URV), Spain, in 2018. He is an active member of the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE). Prof. Jainendra Shukla is the founder and director of the Human-Machine Interaction research group and is an Assistant Professor at the Department of Computer Science and Engineering in joint affiliation with the Department of Human-Centered Design IIIT-Delhi. He enthusiastically investigates how empowering social robots and machines with adaptive interaction abilities can improve the quality of life in health and social care. He has been awarded the startup research grant by SERB, DST, and the research excellence award at IIIT-Delhi. He is the recipient of the prestigious Industrial Doctorate research grant by the Government of Spain in 2014. He received a B.E. degree in Information Technology from the University of Mumbai in First Class with Distinction in 2009. He pursued his M.Tech. Degree in Information Technology with a Specialization in Robotics from the Indian Institute of Information Technology, Allahabad (IIIT-A) in 2012. He received his Ph.D. in excellent grades with Indu

Prof. Abhinav Dhal is Assistant Professor of Computer Science & Engineering and Head of Centre for Applied Research in Data Science at Indian Institute of Technology Ropar. He is also an Adjunct Senior Lecturer at Monash University and Adjunct Faculty at IIIT-Delhi. He received his PhD from Australian National University and later pursued post doc at University of Waterloo and University of Canberra. His research interests are in computer vision and affective computing. He is Associate Editor of IEEE Transactions on Affective Computing

COURSE PLAN :

Week 1: Fundamentals of Affective Computing

Week 2: Emotion Theory and Emotional Design

Week 3: Experimental Design: Affect Elicitation; Research and Development Tools

Week 4: Emotions in Voice

Week 5: Emotions in Facial Expressions

Week 6: Emotions in Text

Week 7: Emotions in Physiological Signals

Week 8: Multimodal Emotion Recognition

Week 9: Emotional Empathy in Agents/Machines/Robots

Week 10: Online and Adaptive Recognition of Emotions: Challenges and Opportunities

Week 11: Case Study: Updated from Time to Time

Week 12: Ethical Issues: Ethical, legal and Social Implications of Affective Computing