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Advancing Foundational AI Research and Applications through Transdisciplinary Collaboration

Machine learning and artificial intelligence (AI) have recently had tremendous impact across our personal and professional lives. However, much of the recent advances are focused on a small set of problem types – those that mimic some human activities and those in which we have enormous amounts of data. However, many applications do not always fit neatly into the assumed framework and problem types for standard machine learning and AI methods. For example, we may have data coming from non-visual sensor systems bringing with them unique challenges related to the underlying sensing phenomenology and application-based constraints. In order to develop machine learning and AI algorithms best suited to the applications at hand, transdisciplinary research and, subsequently, the development of approaches with underlying assumptions that match the application are required. During this talk, I will give an overview of our efforts in transdisciplinary research, outline the need for merging disciplines, and discuss approaches that learn from the uncertain, imprecise data we expect to see.