

Title: Going Beyond the Known: Detecting Unknown Categories in Computer Vision

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Abstract: Supervised learning, the harbinger of machine learning over the last decade, has had tremendous impact across application domains in recent years. However, the notion of a static trained machine learning model that identifies one among a few pre-specified set of classes is becoming increasingly limiting, as these models are deployed in changing and evolving environments. Among a few related settings, open-set and open-world learning have gained interest among practitioners to address this need of learning from new information, including the much-needed ability of saying "I don't know". In this talk, we will briefly discuss these settings, and highlight their importance in addressing real-world challenges. The talk will cover some of our recent research on open-world object detection (CVPR 2021), novel class discovery (ECCV 2022), and open-set object detection (WACV 2024) -- and also share interesting real-world use cases of these efforts. The talk will conclude with pointers to what could be ways to move forward as a community in this direction.

Bio: Vineeth N Balasubramanian is a Professor in the Department of Computer Science and Engineering at the Indian Institute of Technology, Hyderabad (IIT-H), India, and was recently a Fulbright-Nehru Visiting Faculty Fellow at Carnegie Mellon University until July 2023. He is also the Founding Head of the Department of Artificial Intelligence at IIT-H from 2019-22. His research interests include deep learning, machine learning, and computer vision with a focus on explainability, continual learning and learning with limited labeled data. His research has been published at premier venues including ICML, CVPR, NeurIPS, ICCV, KDD, AAI, and IEEE TPAMI, with Best Paper Awards at recent venues such as CODS-COMAD 2022, CVPR 2021 Workshop on Causality in Vision, etc. He was recently the General Chair of ACML 2022 held in India, and regularly serves in senior roles for conferences such as CVPR, ICCV, AAI, IJCAI, ECCV. He is listed among the World's Top 2% Scientists (2022,2023), and is a recipient of the Research Excellence Award at IIT-H (2022), Google Research Scholar Award (2021), NASSCOM AI Gamechanger Award (2022), Teaching Excellence Award at IIT-H (2017 and 2021), Outstanding Reviewer Award (IJCAI 2023, ICLR 2021, CVPR 2019, etc), among others. For more details, please see <https://people.iith.ac.in/vineethnb>.