



Organized by **Mehta Family  
School of  
Data Science  
& Artificial  
Intelligence**

Indian Institute of Technology  
Guwahati,  
Guwahati-781039, India

the **CT AI** talk series



## Improving Image-based Taxonomic Classification by Training with DNA Barcodes



**Graham Taylor, PhD**

Research Chair and Professor,  
University of Guelph, Canada

Recent advances in machine learning have enabled impressive results in taxonomic classification using image data alone. However, DNA barcodes provide a wealth of information about species relationships that is not always visually apparent. In this talk, I'll present our work on CLIBD and the BIOSCAN-5M dataset, which leverage multi-modal contrastive learning to improve image-based taxonomic classification by incorporating DNA barcode data during training. CLIBD extends the self-supervised learning approach of BIOCLIP to align representations of images, DNA barcodes, and taxonomic labels in a shared embedding space. Using the newly released BIOSCAN-5M dataset of over 5 million insect specimens with paired images and DNA barcodes, we show that this multi-modal training approach significantly improves zero-shot image classification performance – boosting accuracy by over 11% compared to image-only methods. Crucially, while DNA data is leveraged during training, our model enables rapid taxonomic classification using images alone at inference time. This work demonstrates the potential for integrating genetic information to enhance computer vision systems for biodiversity monitoring at scale.

### About the Speaker

Graham Taylor is a Canada Research Chair and Professor of Engineering at the University of Guelph. He co-directs the University of Guelph Centre for Advancing Responsible and Ethical AI and is a Faculty Member at the Vector Institute for AI. He has co-organized the CIFAR Deep Learning Summer School, and trained more than 80 researchers. In 2016 he was named as one of 18 inaugural CIFAR Azrieli Global Scholars. In 2018 he was honoured as one of Canada's Top 40 under 40. In 2019 he became a Canada CIFAR AI Chair. He spent 2018–2019 as a Visiting Faculty member at Google Brain, Montreal. From 2021–2023 he served as Vector's Research Director. Graham co-founded Kindred, which was featured at number 29 on MIT Technology Review's 2017 list of smartest companies in the world, acquired by Ocado in 2020. He is the Academic Director of NextAI, a non-profit accelerator for AI-focused entrepreneurs. Website: <https://www.gwtaylor.ca/>

**Venue: Online**  
**Time: 5:30–6:30 p.m. IST**  
**Date: 12–June–2025**