Robust Machine Vision

Deep Learning enables machines to reach human-level accuracy in complex perceptual tasks like object recognition. Despite this success, however, I will show that today’s algorithms still fail to grasp the physical and causal structure of our world and instead rely on weak statistical signals. This failure is the root cause of many problems that plague machine vision, including inefficient data usage, strange susceptibilities as well as limited generalisation and transfer capabilities. I will discuss three examples in which specific failure modes yield insights into the inner workings of deep neural networks and highlight ways towards more robust machine vision algorithms.