Raunak Chowdhury

In his talk, Calvin covered both the basics of machine learning and what he was working on Facebook. In his discussion of the ML paradigm, he mentioned that instead of viewing a problem as y = f(x), where x is the input sentence in English and y is the output sentence in French, ML researchers use y = f(x, θ) in addition to a loss function to compute y, where θ is an enormous network and the loss function was a function that judged how correct the model was with its output. These mechanisms are part of *convolutional neural networks*. Calvin also stressed the importance of ML’s nature as a black box, which introduced a few problems when using it. For example, it was possible that the model could “memorize” the testset by generalizing the inputs expected, a phenomenon called *overfitting*. A few solutions were proposed, including data augmentation, a process whereby the testset by making copies of training data, allowing a researcher to get more data from the same set. He also discussed a folding connected network, which is a simple ML model, albeit inefficient.

The second half of the talk focused on Calvin’s research, both former and current. He is currently working on an OCR problem in which the model needs to recognize signs from pictures (such as highway signs). He gave us a (highly theoretical) example of what a model does and engaged the audience in trying to address errors, such as when a pixel unattached to the area of interest returns a high coefficient of certainty. He also delved into error loss maximization using perturbation minimization — in other words, what is the smallest number of perturbations (a value called epsilon) that produces the largest amount of loss?