To: Ben Goertze[redacted]
Cc: Jeffrey Epstein[jeevacation@gmail.com]
From: [redacted] on behalf of Itamar Arel [redacted]
Sent: Sat 10/10/2009 8:41:14 PM
Subject: Comparison to Poggio's work

One of Poggio's students recently published his Ph.D. which is centered on hierarchical learning methods for vision and speech
(see: http://web.mit.edu/jvb/www/papers/bouvrie_thesis_2009.pdf).
Here are three fundamental differences between our system and Poggio's work:

1. His approach does not capture temporal information, but rather just spatial dependencies. In other words, each of his nodes learns to characterize patterns whereas our nodes inherently represent spatiotemporal information. I think this is critical for robustness and induced invariance to translation, mild rotation and other transformations.

2. There is no feedback from upper layers down to the lower layers in his architecture. Such feedback, in my mind, is critical for synthesizing beliefs, overcoming partial observation conditions (i.e. missing information), and yielding robustness as a whole. The cortex certainly has feedback (i.e. recurrent) connections that play a key role in cognition.

3. The basic cortical circuit in his work uses Kernel mapping (i.e. statistical machine learning techniques), where mine is based on prediction using recurrent neural networks - a much more elegant mechanism in my view. Moreover, it has been proven to yield good results across many domains.

I hope this helps clarify things.

- Itamar