The Face of Emotion:
A Computational Model of the Production and Visual Perception of Facial Expression of Emotion

Abstract
How many facial expressions of emotion can humans produce and visually recognize? How does our brain interpret them? Did some of these non-verbal signals evolve to serve as grammatical markers in human language? In this talk, I will overview the research we have done to address these fundamental questions. Specifically, we will show that:

a. People consistently produce at least 23 facial expressions of emotion (much more than the previous 6 proposed by Darwin),
b. These emotions are perceived categorically, not as combinations of more basic categories,
c. Our visual system interprets them by analyzing shape and shading image features that represent the movement of individual facial muscles (known as action units, AUs), and
d. Three of these emotions have been compounded to form a (universal) grammatical marker of negation in human language (which we call the "not face").

I will present a computational model of this perception of facial expressions and show behavioral and imaging experiments in favor of this model. For example, we will identify a small region in posterior STS dedicated to the coding of individual AUs as predicted by the model. I will also show how this computational model can be used to define computer vision systems that yield superior results to state of the art algorithms and argue that the important problem of these vision tasks is detection, rather than recognition.

Bio
Aleix M. Martinez is a Professor in the Department of Electrical and Computer Engineering at The Ohio State University, Columbus. He is the founder and director of the Computational Biology and Cognitive Science Lab. He is also affiliated with the Department of Biomedical Engineering and the Center for Cognitive and Brain Sciences, where he is a member of the executive committee. More about him: http://www2.ece.ohio-state.edu/~aleix/

We cordially invite you to this special lecture. Your interest and a large attendance would be very much appreciated.

Martin Giese