NLMFF Featured Grantee Matthew Goodwin, Ph.D., Northeastern University

Matthew Goodwin:
I'm Matthew Goodwin. I'm an associate professor at Northeastern University, jointly appointed in the Bouve College of Health Sciences and the Curry College of Computer Science.

Matthew Goodwin:
I am director of the computational behavioral science lab and helped start a doctoral program in personnel health informatics at Northeastern. I have been performing autism research for about the last 25 years and am indebted to the Nancy Lurie Marks Family Foundation for two significant periods of support. First after my PhD in behavioral science, I went and did a post-doctoral training at the MIT media lab and the (Nancy Lurie) Marks Foundation supported that work and so for three years, I was working with computer scientists and electrical engineers to develop new technologies incorporating video, audio and on body wearable physiological devices, that would enable us to capture social communication, restricted repetitive behavior and measures of stress and anxiety, in naturalistic settings. I was quite interested in the application of these technologies to better understand social emotional functioning in individuals with autism, who had difficult times complying with laboratory based observations.

Matthew Goodwin:
The second phase of the (Nancy Lurie) Marks Foundation support was a career development award that enabled me, after my postdoc to start my position at Northeastern, on a tenure track and to build my lab and start applying the technologies that we had developed at MIT into field research in autism.

Matthew Goodwin:
Over the last seven to eight years, we have used these technologies at scale, have published several findings showing that we can automate the detection of repetitive hand flapping and body rocking using three axis accelerometry on sensors. We have demonstrated that we can use bio sensor data from sensors like these in psychiatric inpatient settings, for individuals who engage in high rates of aggressive behavior to other people that tend to be unpredictable behaviors, difficult to anticipate, especially in an individual who may have flattened affect and no verbal communicative ability. We have demonstrated that three minutes of prior biosensor data, can enable us to predict one minute before an aggression occurs with 85% accuracy.

Matthew Goodwin:
These sensors, both the video and the audio and the wearable physiology, are also now being used by several other research groups around the world, as early biomarkers of autism as screeners, as complimentary data to diagnostic assessments, to functional analysis of behavior and to clinical outcome measures that are focused on reducing anxiety or increasing affective regulation.

Matthew Goodwin:
It's with great pleasure that I have been fortunate to work with very good technical people, data analytic people, researchers and clinicians, to support individuals with autism and increase a empirical basis to test hypotheses that we have and to view behavior in a more longitudinal fashion and more naturalistic settings, to a greater number of individuals than are likely able to participate in laboratory or clinic based research.