INTEGRATING BIOMETRIC RESPONSES TO HUMAN BEHAVIOR

Lead contact:

Marco A. Palma, Department of Agricultural Economics
Email: mapalma@tamu.edu ◊ Phone: 979-845-5284

Co-Principal Investigators: Steven Woltering, Nathan Clemens, Jeffrey Liew *(Educational Psychology)*; Luis Ribera, Yvette Zhang, Douglass Shaw *(Agricultural Economics)*; Charlie Hall (Horticulture); Catherine Eckel *(Economics)*; Sherecce Fields *(Psychology)*; Ricardo Gutierrez-Osuna *(Computer Science and Engineering)*; Joanna Lahey *(The Bush School);* Haipeng Cheng *(Marketing);* Yan Alicia Hong *(Health Promotion and Community Health Sciences).*

Key Participating units:
College of Agriculture and Life Sciences: *Agricultural Economics, Agricultural Leadership Education and Communication, Horticultural Sciences, Nutrition and Food Science, Animal Science;* **College of Architecture:** *Landscape Architecture and Urban Planning*; **College of Education and Human Development:** *Educational Psychology;* **College of Liberal Arts:** *Economics, Political Science, Psychology, Sociology;* **College of Science:** *Statistics;* **Dwight Look College of Engineering:** *Computer Science and Engineering, Electrical and Computer Engineering;* **Mays Business School:** *Marketing;* **School of Public Health and Health Science Center:** *Health Promotion and Community Health Sciences;* **Conflict and Development Center; The Bush School of Government and Public Service.**

Anticipated Request Amount ($): 3,000,000

Executive summary of the intended proposal.
Significant technological advances have made biometric equipment available for a wide range of human behavior research. This has resulted in the emergence of new fields that combine traditional data collection methods with collection of biometric data to improve our understanding of conscious and unconscious factors affecting human decisions, learning, and emotions. The main limitation and widespread use of such equipment is its complexity and cost. We propose an integrated research and professional development platform to allow interested faculty, researchers and students to quickly learn and start using biometric equipment in their research efficiently at a low cost. Specifically, we will provide user-friendly biometric equipment with high resolution and professional development opportunities for scholars in the Texas A&M system to start collecting biometric data within a few months. We propose the creation of the **Human Biometrics and Behavior Facility** with two satellite units, one concentrating in adult data collection, and due to the unique nature and specialized requirements of children, the other unit being specific for children and adolescents. In addition a shared mobile unit will allow for data collection outside of laboratory conditions.

The biometric units will combine state of the art equipment to simultaneously collect neurophysiological data of behavioral responses including eye tracking, facial expression analysis to assess human emotions expressed through the face, neural signals (electroencephalography and functional near infrared spectroscopy), galvanic skin response (GSR) and heart rate through integrated stimulus presentation platforms. The requested equipment balances the ability to be advanced enough to capture high resolution data while being accessible enough so that any researcher, with minimal support from our facility, can learn how to use it and start running experiments within a short period of time. Most importantly, this will be a game-changing investment for the Texas A&M research enterprise, because this equipment and facility will allow for cutting edge research, interdisciplinary collaboration, unique student high impact learning experiences, and it will increase Texas A&M's competitiveness for external funding aimed at basic, translational, and applied research.