<u>Summary of Presentation by Dr. Papakostas</u>

In the presentation by Dr. Papakostas, focused on human behavior, emotions, and learning from multiple modalities, he started by giving a background on his journey which took him from completing his Ph.D. at UTA to University of Michigan and to his current position as a Research Scientist at GN in Chicago. He talked about how GN is a group of quite a number of companies. The logos/icons he showed on the slide for the companies appeared to be at least ten in number.

He then described human behavior related to emotions, actors, and cognition. He gave three points about human behavior – population generic patterns, subjective expression of these patterns, and multi-dimensional effect on body. Many differences come into play with regards to feelings and their expressions. For example, different population groups have different needs and express divergent behaviors under the same conditions, similar feelings are expressed in different ways by different individuals, and similar behaviors may relate to different causes on different persons.

He discussed human behavioral modeling, using available and relevant user data to detect underlying conditions, predict future behaviors, and provide feedback through insights and recommendations. As an example of technology being a tool to understand human behavior, he shared about signals from head, eye, wrist, ear, body, hands, leg, foot from Human Bio-Signals lab at Texas A&M University. He gave examples of application of assistive technologies – NeuroCog, assessing attention-deficit hyperactivity disorder (ADHD) through BCIs, well-being.

Dr. Papakostas then talked about learning from multiple modalities explaining the multimodal data workflow courtesy of Intellimedia Group, North Carolina State University – data collection, data processing, and data analysis. Learning from multiple modalities is applicable to several scenarios – understanding sleeping behaviors, monitoring fitness activities, language-independent motion recognition, distracted and drowsy driving, and detecting stress. For example, while exploring the relationship between stress and emotion for personalization of learning from multiple modalities, he shared that instead of learning emotion then stress, it was better to learn both in parallel.

He talked about user-centric designs and personalization for predicting mood, stress, and health which can be done using shared generic features to predict group-specific features and which can also be modified in setup to predict individual-specific features.

Dr. Papakostas discussed cognition, fatigue, and distraction mentioning learning robust representations for detection of physical fatigue, predicting cognitive performance, detecting cognitive fatigue and inattention. He also discussed the relationship between human behavior and hearing loss explaining among other things that contrary to the opinion that hearing loss is a condition found in the elderly, that it has been noted in individuals who are much younger.

Dr. Papakostas ended with a couple of videos. The first video showed work done by David Sullivan, an undergraduate, that worked with him over the summer, visualizing sound. He also explained sound signals having to do with time domain, frequency domain, and sub-frequencies. The second video showed work done by Daniel Dittberner, an undergraduate as well, that worked with him over the summer, mapping audio sources to vibration.

It was great learning experience for me to witness Dr. Papakostas's presentation.