PHYSIOLOGY-MODEL BASED ARTIFICIAL INTELLIGENCE FOR PERSONALIZED HEALTH MONITORING IN DAILY LIFE

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Concise summary of the idea including the specific questions:

Continuous health monitoring technology with unobtrusive sensing devices like smartwatches has been commonly used in individuals' daily life for self-health management. In recent years, the daily life monitoring technology has been introduced to clinical practice to accelerate the shift from in-hospital care to home-based care. Despite the popularity of the daily life health monitoring, current monitoring models typically rely on population-based criteria that define an individual's abnormal health range based on group-level observations. These models fail to adaptively track an individual's physiological responses to their normal daily physiological activities and emotion states. Consequently, these limitations often cause excessive false alarms, provide unreliable health monitoring outcomes, and eventually hinder the development of personalized health management and intervention strategies.

To address these challenges and build a truly personalized monitoring model, my research focuses on developing novel physiology-model based artificial intelligence (PMB-AI) technologies. These technology combine physiological interpretability and data-driven computing accuracy to create individual's health baseline models, or virtual twins. The models are built using both individual physiological signals and general physiological knowledge to estimate personalized physiological responses to physical activity and emotion states in daily living. Early signs of individual's subtle or sudden health changes are expected to be identified by comparing the model's predicted physiological responses with the actual measured responses.

The objective of the Sandpit or Dragon's Den session:

I would like to increase the impact of my research and explore potential collaboration to transfer our developed PMB-AI technologies from the fundamental technology level to real application level.