Your IDP @ PhoneStudy

Students of computer science at the TUM are cordially invited to join our interdisciplinary research team at the Ludwig-Maximilians-Universität München (LMU) for the pursuit of their IDP. The PhoneStudy project exists since 2014 and constitutes a cooperation between the departments of psychology, computational statistics (Prof. Bischl), and media informatics (Prof. Hussmann) at LMU. The main goal of the project is to collect digital footprint data from of-the-shelf smartphones and to relate these data to psychologically relevant phenomena (e.g., personality, intelligence, motives etc.). Hence, we aim to use these data to develop tools for the prediction of critical life-outcomes in the area of digital phenotyping (e.g., psychopathology, well-being etc.). Furthermore, together with teams from other universities (University of Coimbra, WWU Münster, Stanford University, UT Austin)[1], our group is working on the creation of standard procedures for the usage and evaluation of sensing-technology in the social sciences.

You would contribute to achieving these goals by performing conceptional work together with our interdisciplinary team as well as to provide creative solutions to challenging problems, from an IT perspective. During the complete process, you will be fully integrated in all team activities and will receive supervision from experienced researchers. Furthermore, you will take over a well defined part of the project and will self-reliant pursue its completion. Interactive project meetings will take place weekly to discuss progress and consecutive steps.

- Suggested Lecture for IDP Students:
    - Mensch-Maschine-Interaktion I Vorlesung und Übung (Prof. Dr. A. Schmidt, 5 SWS, Medieninformatik)

Participation of IDP students is possible in several parts of the project:

- **Mobile Sensing Research**
    - **Create tools for social science researchers to collect high-frequency data about real-world behavior**
      Researchers in social sciences, increasingly aim to utilize mobile sensing technology of smartphones and wearables to collect valid and reliable data about individual behavior. Possible IDP projects in this area (own ideas are welcome):
        - Find a way to use on-board sensors to quantify groups of surrounding people
        - Find a way to identify if participants are engaged in conversations
        - Find a way to measure environmental variables with a smartphone (illumination, noise level, precise location, presence and proximity of other objects and subjects)
        - Create personas and their possible use cases and perform related user tests

[1] https://lifesensingconsortium.org/

    - **Merge code of existing app projects for standardization in research**
      An important part of standardization efforts for mobile-sensing research is the seizing and unification of already existing software. IDP students can be involved in:
        - Evaluation and ranking of existing mobile sensing applications regarding robustness, applicability, usability, functionality, maintainability, data-quality and validity (Beiwei, AWARE, emotionsense)
        - Identification of the best functionalities and features (frontend and backend) in individual projects - suggest usage of single libraries for research team
- **Research Backend and Analysis System**
  For empirical studies within our project we are using a backend-system for data collection and for the monitoring and visualization of the collected data. The analysis system for study-monitoring, was already created by Christian Smutek in the course of his IDP. These systems are very important for researchers as they aim to monitor the collected data for quality and validity.
    - Help to create and extend a dynamic real-time analysis system for mobile-sensing researchers
        - Create an alert and monitoring system for anomaly detection in user data and server log data
        - Suggest, action plans and steps for dealing with critical events and create measures and precautions for preventing future events
    - Create automatic feedback sheets/infographics for participants in large-scale, real-world sensing studies with regard to psychological factors
- **Web-Presence**
    - Create a visually attractive website with information for study-participants with a focus on usability and intuitive user-guidance
    - Find a way to make complex technology (on device feature-extraction) understandable for all participants

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Previous Research Activities

Stachl, C., Hilbert, S., Au, J.-Q., Buschek, D., De Luca, A., Bischl, B., … Bühner, M. (2017). Personality Traits Predict Smartphone Usage. *European Journal of Personality*, *31*(6), 701–722. http://doi.org/10.1002/per.2113

Schoedel, R., Au, Q., Völkel, S. T., Lehmann, F., Becker, D., Bühner, M., … Stachl, C. (2018). Digital Footprints of Sensation Seeking. *Zeitschrift Für Psychologie*, *226*(4), 232–245. http://doi.org/10.1027/2151-2604/a000342

Schuwerk, T., Kaltefleiter, L., Au, Q., Hösl, A., & Stachl, C. (2018). Enter the Wild: Autistic Traits and Their Relationship to Mentalizing and Social Interaction in Everyday Life. https://osf.io/6mcgv/