List of Potential Projects for the Wayne State Summer Exchange Students

May 20 – June 28, 2019

Biomedical Engineering

- Development of a wideband-probehead for nuclear quadrupole resonance spectroscopy between 15 and 25 MHz
  Requirement: The student must have good skills in electronic design and ideally some experience with RF electronics.
  Institute: Institute of Medical Engineering
  Supervisor: Prof. Scharfetter

- User friendly program for supporting the design of wideband probeheads for nuclear magnetic resonance spectroscopy
  Institute: Institute of Structural Concrete
  Supervisor: Prof. Scharfetter

Chemical Engineering

- New Na-Ion Conductors for Green Energy Storage: Synthesis and Ionic Transport
  Institute: Institute for Chemistry and Technology of Materials
  Supervisor: Prof. Wilkening

- Fluorine-Ion Batteries: First Steps Toward a New System to Store Electricity
  Institute: Institute for Chemistry and Technology of Materials
  Supervisor: Prof. Wilkening

- The behavior of the aluminum electrode in a rechargeable Al-S battery
  Institute: Institute for Chemistry and Technology of Materials
  Supervisor: Prof. Gollas
- **Hydraulics of Two-Phase Taylor Couette Contactors**  
  (well tuned mix of lab-activity and simulation)  
  **Institute:** Institute of Chemical Engineering and Environmental Technology  
  **Supervisor:** Prof. Siebenhofer

- **Mass Transfer in and Mass Transfer Performance of Two-Phase Taylor Couette Contactors**  
  (comparison of modelling and experiments)  
  **Institute:** Institute of Chemical Engineering and Environmental Technology  
  **Supervisor:** Prof. Siebenhofer

- **CO2 based bulk chemicals**  
  (catalytic synthesis, separation, specification, modeling of conversion and processes)  
  **Institute:** Institute of Chemical Engineering and Environmental Technology  
  **Supervisor:** Prof. Siebenhofer

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**Computer Science**

- **Development of learning simulations in the game engine Unity**  
  **Institute:** Institute of Interactive Systems and Data Science  
  **Supervisor:** Prof. Gütl/ Dr. Pirke

- **Data Analysis and Visualization of Game Development Data**  
  **as part of the research project VISDAT**  
  **Institute:** Institute of Interactive Systems and Data Science  
  **Supervisor:** Prof. Gütl/ Dr. Pirke

- **Visual Analytics Concept for Pupils and Children Reseraching on Weather Data**  
  **Description:** The goal of this project is to elaborate a concept for a visual analytics system that allows children to research on weather information. This includes literature research on information visualisation of weather data appropriate for children, creation of visualisation mock-ups or prototypes, and elaboration of a basic visual analytics concept.  
  **Institute:** Institute of Interactive Systems and Data Science  
  **Supervisor:** Prof. Gütl/ Dr. Nussbaumer

- **Interactive data visualization for analysis and discovery of patterns in large data sets**  
  **Institute:** Institute of Computer Graphics and Knowledge Visualisation  
  **Supervisor:** Prof. Schreck
Visual retrieval of images and 3D objects with application to Cultural Heritage object repositories
Institute: Institute of Computer Graphics and Knowledge Visualisation
Supervisor: Prof. Schreck

Electrical and Computer Engineering

- Implementation and evaluation of trusted localization mechanisms
  Institute: Institute of Technical Informatics
  Supervisor: Prof. Römer

- Characterisation of the Transmission Channel of Optical Wireless Links
  Institute: Institute of Microwave and Photonic Engineering
  Supervisor: Prof. Leitgeb

- Comparison of Optical Wireless and RF (microwave) Wave Propagation
  Institute: Institute of Microwave and Photonic Engineering
  Supervisor: Prof. Leitgeb

- Weather Influence on Optical Wireless Links compared to RF-links
  Institute: Institute of Microwave and Photonic Engineering
  Supervisor: Prof. Leitgeb