

# Understanding and Exploring the Fundamentals and Applications of Evolutionary Social Behaviors and Interactions Through ICT-Based Extra-Scale Privacy-Preserving Real-World Experimentations

---

Prof. Dr. Xiaoming Fu

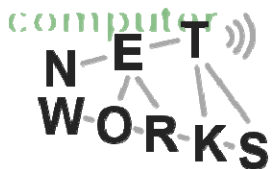
Computer Networks Group

Institute of Computer Science

Faculty of Mathematics and Computer Science  
Georg-August-University of Göttingen, Germany

[fu@cs.uni-goettingen.de](mailto:fu@cs.uni-goettingen.de)

<http://www.net.informatik.uni-goettingen.de/>



GEORG-AUGUST-UNIVERSITÄT  
GÖTTINGEN



- Various scientific research communities have worked on the modeling and applications of various social networks
  - Sociology, anthropology, biology, physics, epidemiology, forestry/environmentology, geography ....
  - As a complex system, analyzed through modeling, simulations, interviews or sometimes small-scale experiments
- Existing work on the Internet of Things and Social Networks *from a Computer Scientist's perspective*
  - Through (nearly) ubiquitous ambient intelligent devices for computational, memorial and/or communication purposes
  - Affiliated w/ humans; being deployed in various environments
- Converging above concepts: a unique opportunity for **extra-scale** and **realistic** social network research

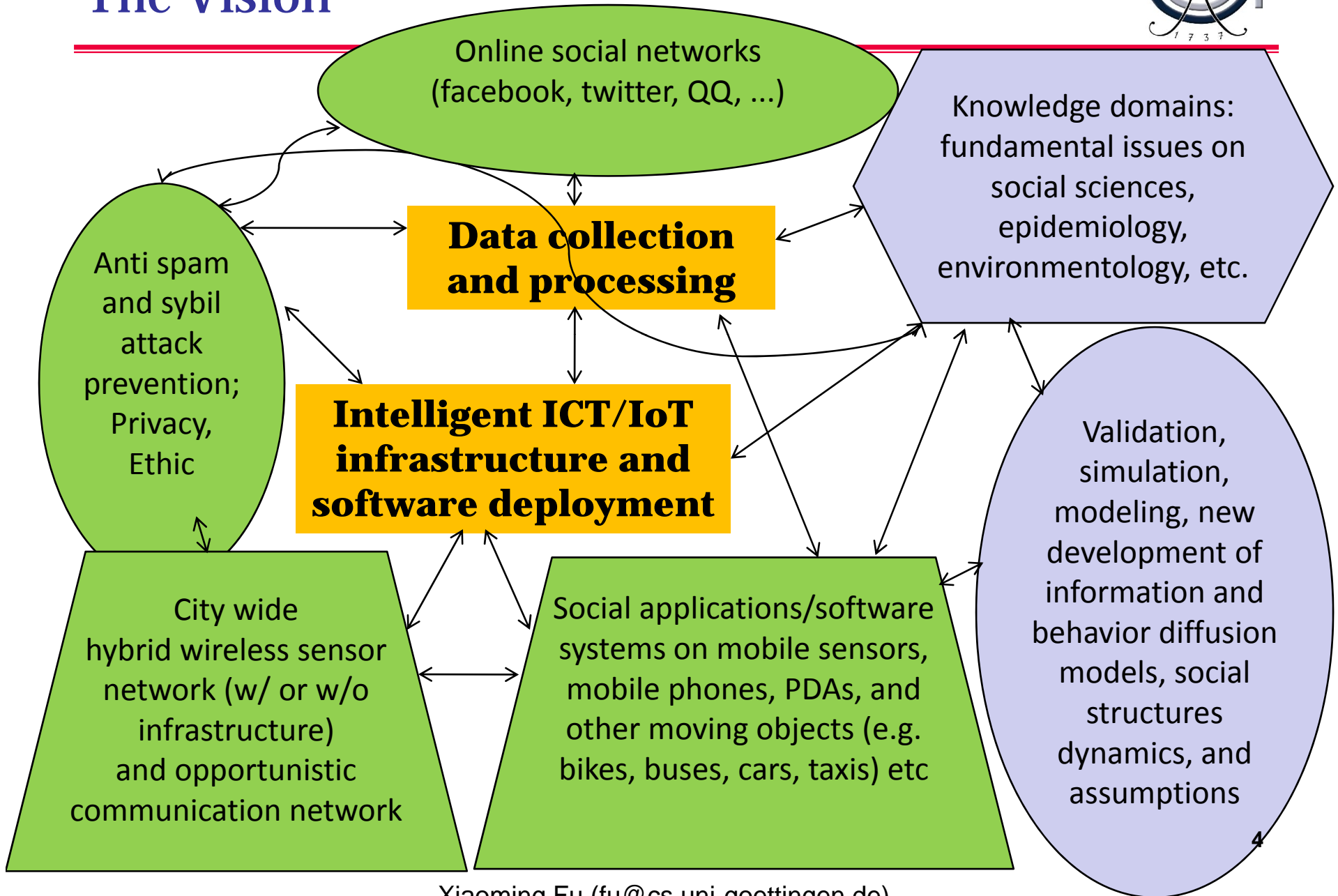
# Problem Statement

---



- **Analysts on social network/link structure & dynamics:**
  - Mostly relying on assumptions and simulations, which may not reflect some aspects (e.g. situation-dependency) of social behaviors
- **Scientific domain experts (e.g. epidemiology, sociology):**
  - Hardly can find ways to distinguish identities in a dynamic and global environments (without disclosing the users' privacy)
  - Evolutional social behaviors desired but data hardly able to get
- **Information Technology (IT)/Internet of Things (IoT):**
  - Able to design, deploy and measure complex network infrastructures with high awareness of security, privacy
  - But only limited knowledge on applied domains(' semantics)
- **An integrated approach is missing & of paramount importance to understand social nets as complex systems**
  - Like facebook but not owned&protected by a proprietary company

# The Vision



# The Expected Contributions

---



- **Novel approach for extra-scale realistic experimental data collection**
  - Through global infrastructure using Internet technologies and large-scale mobile social network experiments
  - Experimenting privacy-preserving communications in various environments, by volunteers and ordinary users
  - Community forming, detection, and leaving at users' will
- **New evidence for analyzing social network structure, dynamics and evolutions**
- **Novel approach for studying the impacts of human mobility, social interaction and environmental issues**
- **Establishment of new inter-disciplinary research agenda**

# Towards an FET Initiative

---



- Core group identified; 20+ institutions interested and may be selected based on the size and goal for FET initiative
  - University of Göttingen (CS, social nets, sociology), DE
  - MPI-DS (complex systems, epidemic modeling), DE
  - University of Cambridge (CS, social nets), UK
  - Deutsche Telekom Laboratories (online social nets; DTN), DE
  - NEC Europe Network Laboratories (online social nets), DE
  - Swedish Inst of Computer Science (mobile social nets, DTN, data mining), SE
  - Nanjing University (EE, CS, sociology, epidemiology), CN
  - Tsinghua University (CS, social nets, sociology), CN
  - **and MORE ...**