

CPD 2019: The Second Workshop on Combining Physical and Data-Driven Knowledge in Ubiquitous Computing

*****Part of Ubicomp 2019*****

Sept 9 and 10, 2019

London, UK

Website: <https://ubicomp-cpd.com/>

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Many real-world ubiquitous computing systems make use of data-driven algorithms that require a significant amount of data to obtain good performance. System performance of these pure, data-driven systems largely depends on the quantity and quality of the data they use. Under ideal conditions – representative, large, balanced and labeled data – pure data-driven methods perform very well. However, in real-world systems, collecting data can be costly or impossible due to practical limitations. Physical knowledge (strong priors), can help alleviate issues that emerge when good data is limited. This includes 1) domain knowledge from experts, 2) experience-driven heuristics, and 3) analytic models of physical phenomena. With physical knowledge, we can infer target information more accurately compared to purely data-driven models. These priors can also improve performance and robustness when limited labeled data is available. In recent years, researchers have combined physical knowledge with traditional, data-driven approaches to improve model accuracy and system performance. We aim to attract researchers that are exploring fundamental questions about the integration of physical knowledge and data in real-world systems and deployments. We also aim to identify solutions and methodologies that generalize across various application domains.

*****Topics of interests*****

- Innovations in learning algorithms that combine physical knowledge or models for sensor perception and understanding
- Experiences, challenges, analysis, and comparisons of sensor data in terms of its physical properties
- Sensor data processing to improve learning accuracy
- Machine learning and deep learning with physical knowledge on sensor data
- Mobile and pervasive systems that utilize physical knowledge to enhance data acquisition
- System services such as time and location estimation enhanced by additional physical knowledge
- Heterogeneous collaborative sensing based on physical rules

The application areas include but not limited to:

- Human-centric sensing applications
- Environmental and structural monitoring
- Smart cities and urban health
- Health, wellness & medical

Successful submissions will explain why the topic is relevant to the data limitation caused problem that may be solved through the physical understanding of domain knowledge. In addition to citing relevant, published work, authors must cite and relate their submissions to relevant prior publications of their own. Ethical approval for experiments with human subjects should be demonstrated as part of the submission.

*******Important Dates*******

Submission deadline: June 23, 2019, submit [HERE](#)

Notifications: July 1, 2019.

Camera-ready: July 8, 2019.

Workshop: Sept 9 and 10, 2019.

*******Submission Guidelines*******

Please submit short papers that are at most **8 pages** in the ACM **SIGCHI Extended Abstract** format. Submissions may include as many pages as needed for references. The submissions should not be anonymous. The ACM template can be found [here](#).

*******Organizer*******

Workshop Chairs:

Xinlei Chen (Carnegie Mellon University)

Shijia Pan (Carnegie Mellon University)

Jorge Ortiz (Rutgers University)

Technical Program Committee:

Yong Li (Tsinghua University)

Jun Han (National University of Singapore)

Roozbeh Jafari (Texas A&M University)

Dezhi Hong (University of California San Diego)

Mi Zhang (Michigan State University)

Yuan Tian (University of Virginia)

Yanjun Han (Stanford University)

Bing Liu (Facebook AI)

Ming Zeng (Facebook Inc.)

Pan Hu (Stanford University)

Wen Hu (The University of New South Wales)

Advising Committee:

Jie Liu (Microsoft Research, Harbin Institute of Technology)

Pan Hui (Hong Kong University of Science and Technology, University of Helsinki)

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Pei Zhang (Carnegie Mellon University)

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