

Data-Driven Cyber-Physical Systems for Smart Cities

In this spring semester, the Department of Computer Science at Rutgers will offer a new graduate-level seminar course **16:198:671 Data-Driven Cyber-Physical Systems for Smart Cities**. This class is ideal for graduate students (or high-level undergrads) who want to learn various research topics about **Data Science**, **Internet of Things**, and **Cyber-Physical Systems** with applications on **Smart Cities** based on real-world systems and data. Some topics covered include:

- **Large-Scale Urban Systems as Complex Internet of Things:** e.g., cellphone, Wi-Fi, taxi, bus, subway, bike, electric vehicles, smart grid, and finance systems;
- **Urban Data Collection, Management, Processing, and Visualization:** e.g., participatory/opportunistic sensing; stream, trajectory, and graph data management for heterogeneous urban data, streaming data processing, interactive visualization;
- **Spatial-Temporal Data Analytics:** e.g., data fusion, visual analytics, data-driven predictive modeling, interdependency analyses;
- **Data Predictive Control** in Smart Cities;
- **Human-in-the-Loop** in Smart Cities;
- **Privacy and Security** in Smart Cities;
- **Case Studies** in Three Urban Domains: Telecommunication, Transportation, and Energy.

Prerequisites: Preliminary knowledge on Calculus, Linear Algebra, and Probability is required. For non-CS students, basic skills for high-level programming languages (e.g., C++, Java, R, Python or SAS) are required.

Grading: No exams, and all grades are based on class participation and a semester-long project.

Please contact Prof. Desheng Zhang at d.z@rutgers.edu if you have any questions about the course.

More about the research topics related to urban systems and data can be found at <https://www.cs.rutgers.edu/~dz220/research.html>