DAFNI as a Digital Twin Platform: Vision Roadmap and Pilot

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A bit about myself

- **Ph.D. in Automatic Control and Systems Engineering**
  Oct. 2014 - Mar. 2019
  ACSE, *The University of Sheffield*, UK
  Thesis: Novel Matrix Completion Methods for Missing Data Recovery in Urban Systems
  Advisors: Iñaki Esnaola and Daniel Coca
- **Research Associate**
  Oct. 2017 - Present
  ACSE, *The University of Sheffield*, UK
  Advisor: Daniel Coca
- **Research interests:**
  - Matrix completion
  - Network theory
  - Digital twins

My objectives as Champion

- Contribute towards a Vision and Roadmap on the development of Digital Twins
- Implement a pilot study on the Digital Twin concept using traffic data from Sheffield Urban Observatory
- Identify system requirements for the DAFNI platform to accommodate full scale Digital Twins
- Organize a workshop in Sheffield to present results and promote DAFNI within the research community
- Engage with the wider research community with an interest in Digital Twin research
- Lead the engagement with the Sheffield Urban Observatory and collaborate with other traffic modelling groups represented in DAFNI

Pilot study - Traffic flow prediction in Sheffield area

- Data
  - 640 Sheffield City Council sensors that measure traffic flow (no. of cars per minute) every 5 minutes
  - Historical data starting from Aug. 2019
- Milestones:
  1. Store historical data on DAFNI
  2. Create live data stream from Sheffield Urban Observatory to DAFNI
  3. Integrate traffic prediction model in DAFNI to forecast traffic flow 15-30 minutes ahead in particular locations of interest
  4. Visualize predictions against real data