



Building Information, Inhabitant, Interaction and Intelligent Integrated Modeling (BI⁵M)

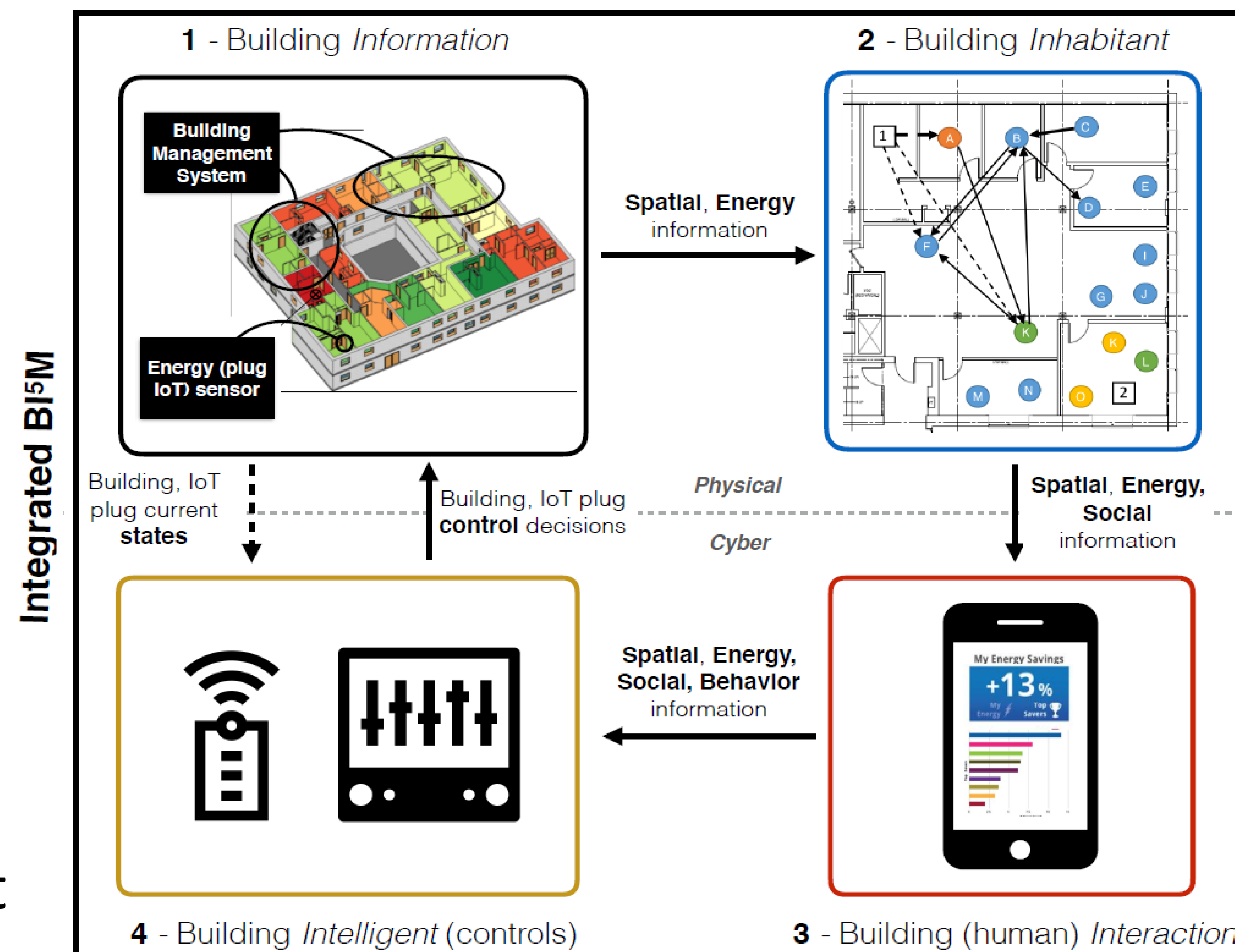
Rishee Jain (PI, Stanford); Neda Mohammadi & Ying Zhang (Co-PIs, Georgia Tech); Xiaofan (Fred) Jiang & Patricia Culligan (Co-PIs, Columbia)

Challenge:

- Our buildings are broken...expensive, bad for the environment, low satisfaction
- Crisis conditions (COVID-19) impact physical-human interactions

Solution:

- CPS control paradigm that encompasses building occupants
- Two-way relationships that link building systems and occupant dynamics to **reduce energy and enhance comfort**
- Digital Twins that capture multi-dimensionality of interactions



Scientific Impact:

- New integrated CPS frameworks and models for linking spatial, energy, social and behavior data
- Global building occupant behavior database
- Fast human-in-the-loop control systems

Broader Impact:

- Reduce energy + emissions of building sector
- Enhance occupant satisfaction + productivity + health
- Engage participating subjects, students, facilities and start-ups locally, nationally, and internationally