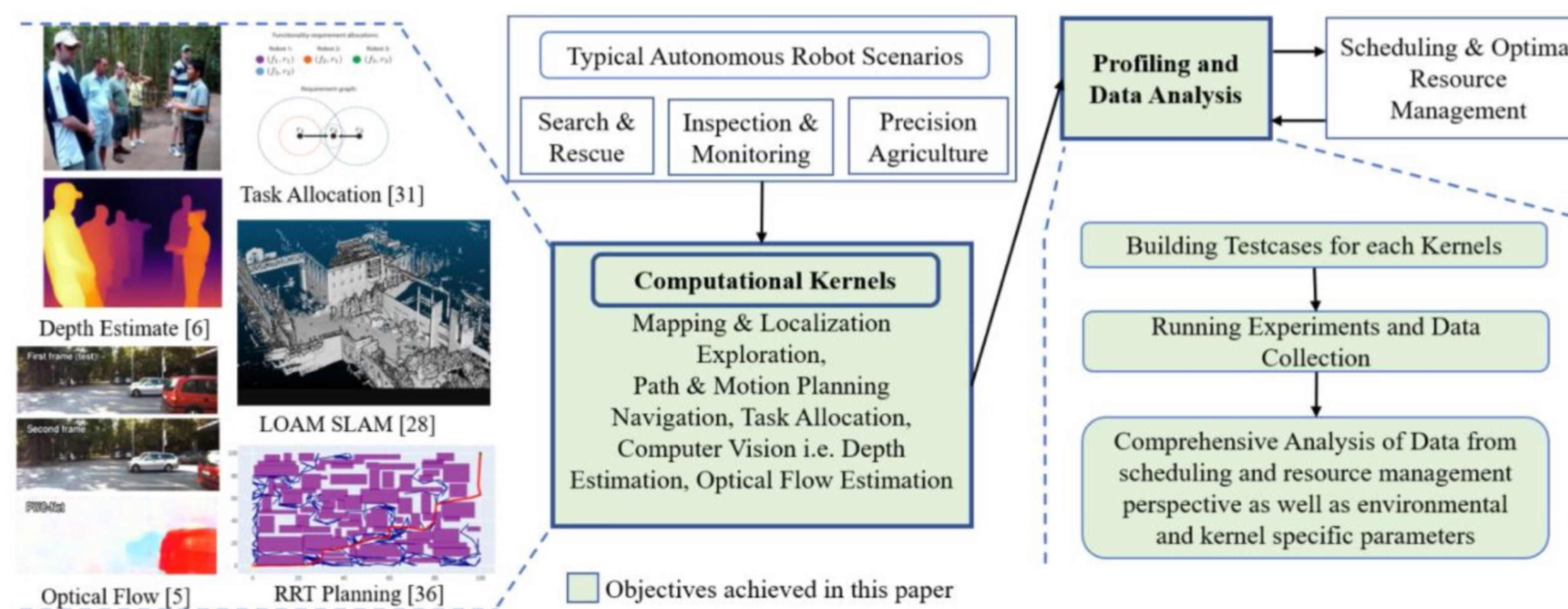


CPS: Medium: Computation-Aware Autonomy for Timely and Resilient Multi-Agent Systems

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Challenge:

- Account for the relationships between environments, tasks, motion, computation, and software reliability in multi-agent systems.
- Computational scheduling for runtime operation and flexible and efficient software multi-versioning.

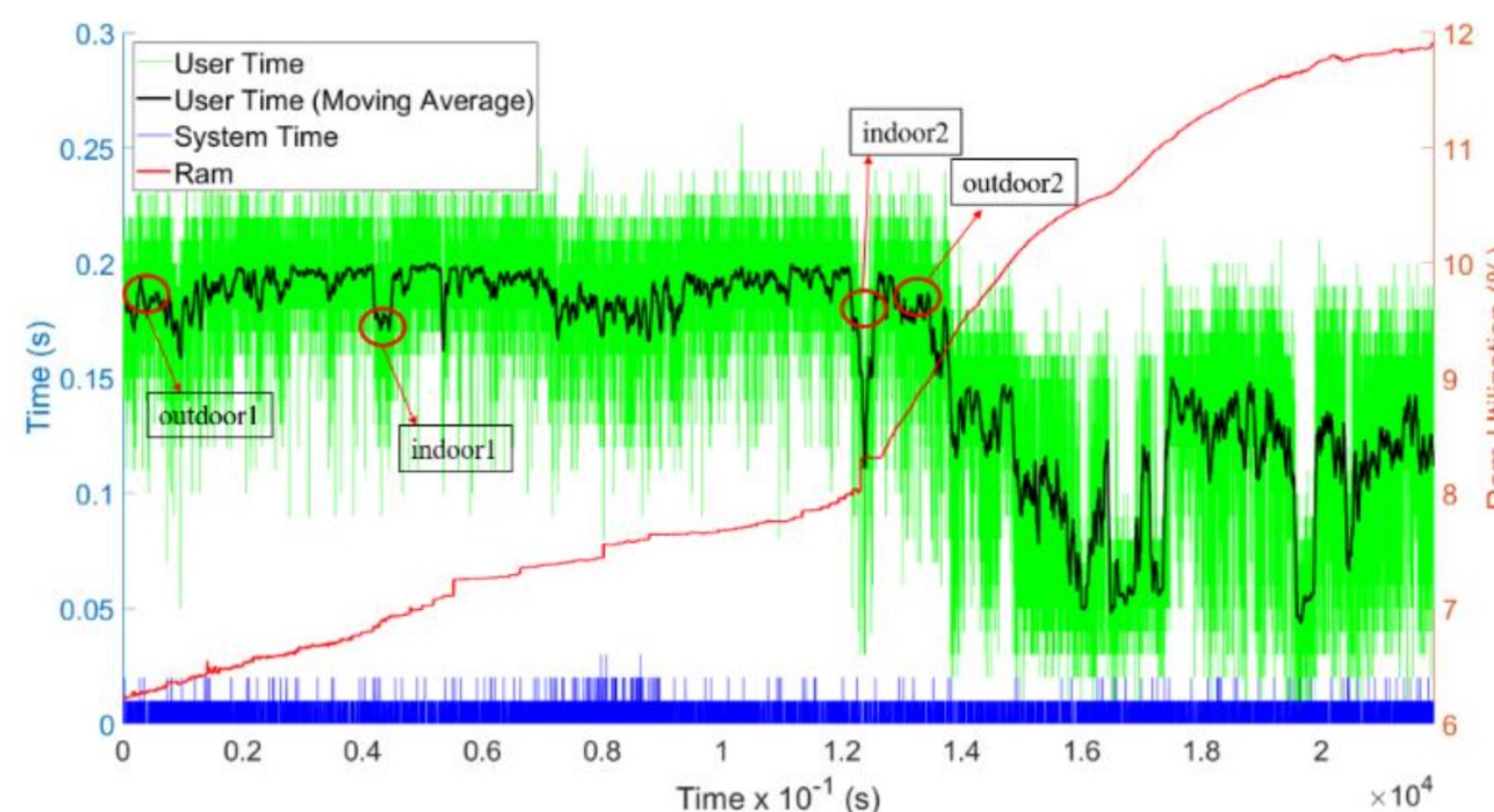


Scientific Impact:

- Unified approach closes the loop for robust CPS with provable behaviors in increasingly complex multi-agent missions across dynamic environments.

Solution (Year 1):

- Created benchmarking dataset and conducted a study of the timing, power, and memory performance of kernels for localization and mapping, path planning, task allocation, depth estimation, and optical flow, across three embedded computing platforms.



Embedded computational benchmarking pipeline for autonomy workloads.

Broader Impact:

- CPS are driven by relationships between algorithms, computing, physical platforms and their interaction with the environment, thus our methods will transfer to broad spectrum of CPS.
- Computational awareness for guaranteed autonomous behaviors will transform safety-critical applications.