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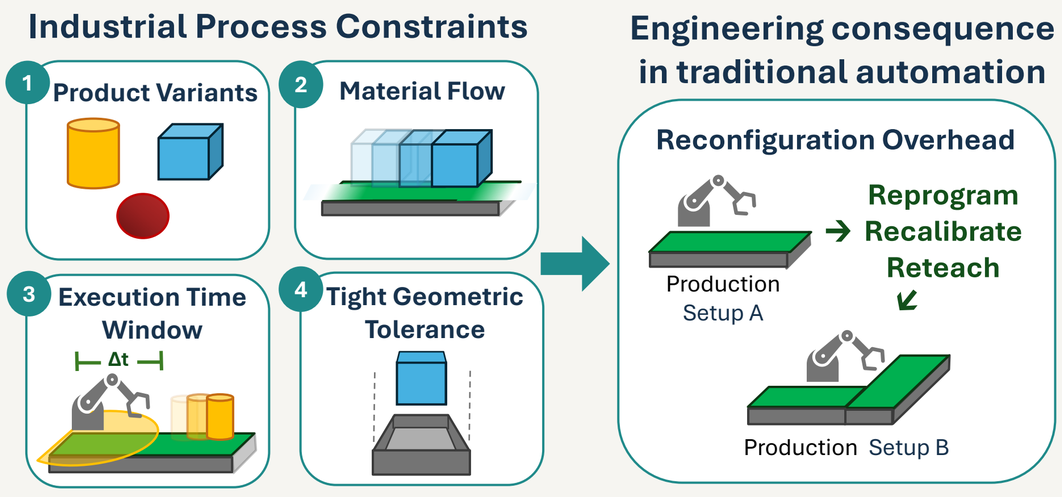
LIBERO-Industry: Benchmarking Robotic Manipulation under Industrial Process Constraints

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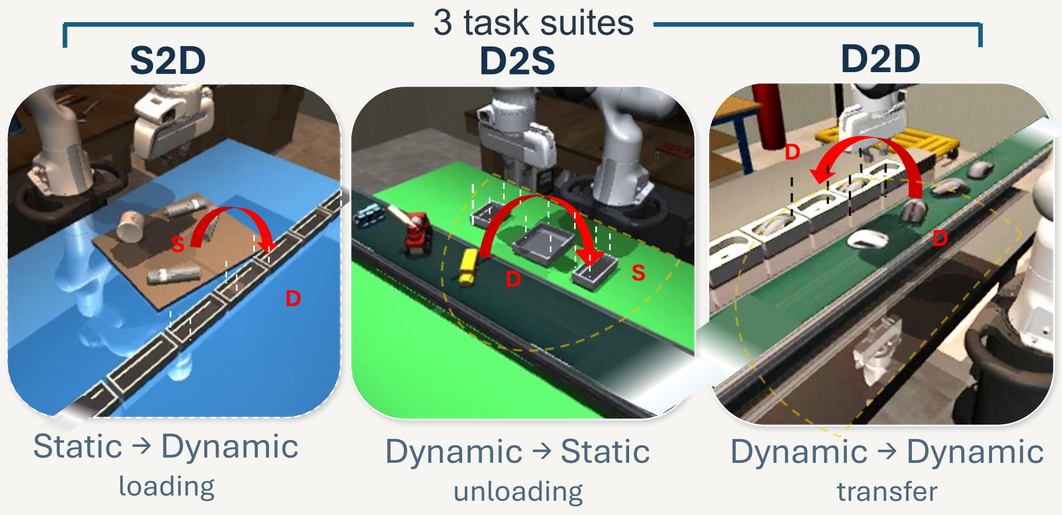
01 MOTIVATION

- **Flexible manufacturing,** e.g., high-mix, low-volume (HMLV) electronics assembly requires frequent product changes and re-engineering in traditional automation.
- **Generalist robot policies** (e.g., VLAs, WAMs) are promising, but existing benchmarks lack systematic evaluation under industrial constraints.
- **Contribution:** *LIBERO-Industry* makes these constraints controllable and measurable.



02 BENCHMARK DESIGN

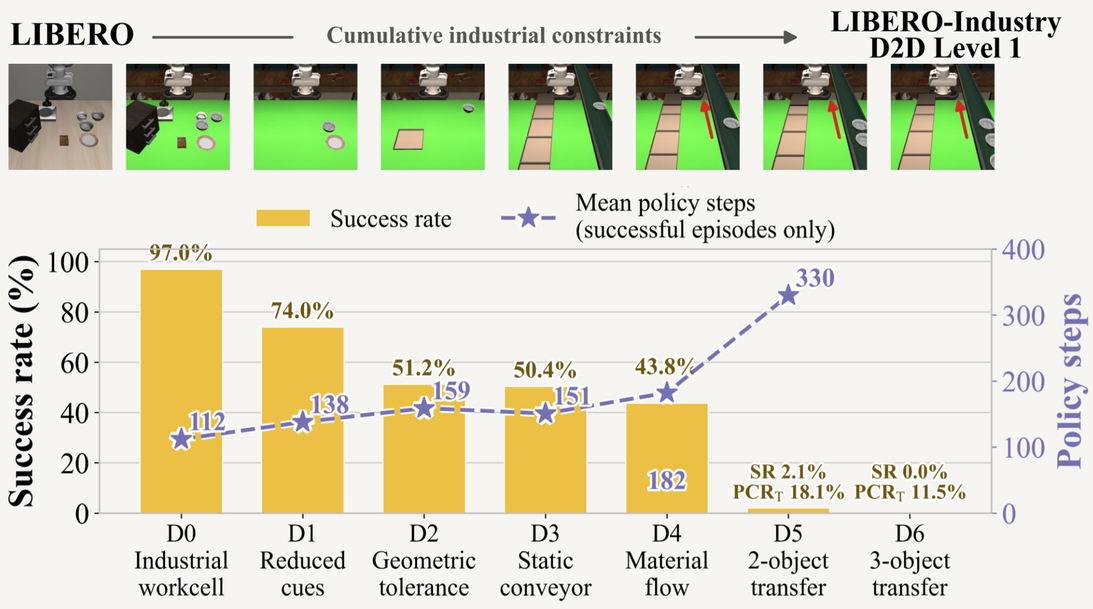
- ***LIBERO-Industry*** extends *LIBERO*, a household manipulation benchmark for robot learning.
- **216 tasks:** 180 training + 36 held-out test



Static → Dynamic loading | Dynamic → Static unloading | Dynamic → Dynamic transfer

03 RESULTS

- **Industrial generalization gap:** Five generalist policies achieve 0/360 full-task successes.
  π0.5, OpenVLA-OFT, UniVLA, X-VLA, Cosmos Policy; n=10.
- **Multi-object transfer bottleneck:** Success falls from 43.8% (D4) to 2.1% (D5, two-object transfer).

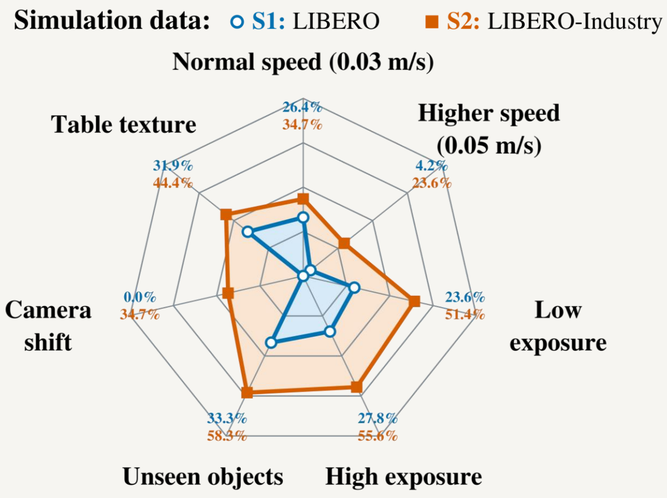


π0.5 fine-tuned on *LIBERO* household task; n=20 per level.
PCR_t : Partial Completion Rate for target-transfers (%) ;

- **Real-world transfer:** With matched policy and real-world data, co-training on *LIBERO-Industry* simulation data achieves higher target transfer completion than on *LIBERO.*



Aubo-i5H arm in a D2S industry workcell.



Partial Completion Rate (PCR_t; %) across seven real-world variations; n=24.

04 CONCLUSION

LIBERO-Industry exposes limitations in generalist policies under industrial process constraints and provides a testbed evaluating policy execution. Industry co-training yield gains in real-world target-transfer completion.

PROJECT AND RESOURCES

IAIE-PhysicalAI.github.io/LIBERO-Industry

REFERENCE

Liu et al. LIBERO: Benchmarking Knowledge Transfer for Lifelong Robot Learning. NeurIPS 2023.