

GT Graffiti: Spray Painting Graffiti Art from Human Painting Motions with a Cable Driven Parallel Robot

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Motivation

Artistic Motivations

1. Preservation – recreate lost artworks
2. Replication – reproduce artwork to magnify messages
3. Amplification – perform motions not otherwise possible by the human artist (e.g. larger, disabled)

Technological Motivations

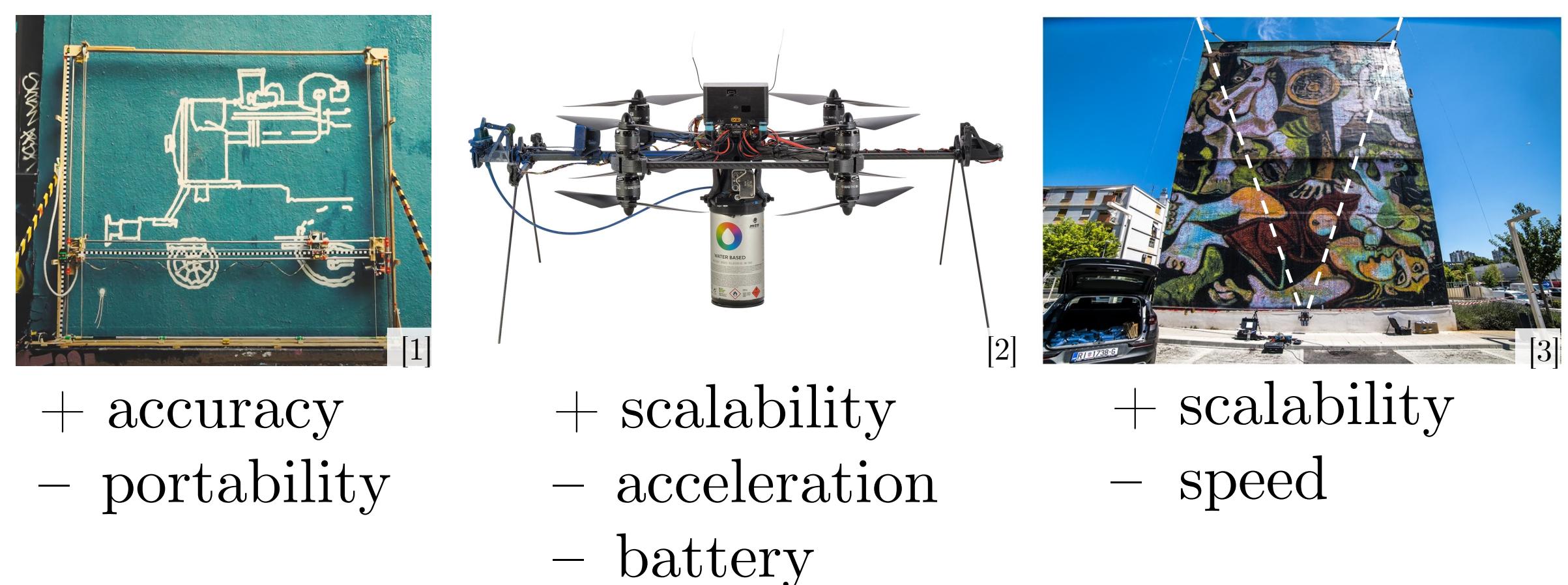
Large-scale, dynamic motions based on human actions has applications in logistics, agriculture, construction, household, etc.

Prior Works

Capture

- GML – mostly on touchscreens → unrealistic
- GML Recording Machine – planar & undocumented

Robot Platforms



Planning

- Industrial painting – uniform coats on curved surfaces (vs graffiti: non-uniform coats on flat surfaces)
- D. Berio '15, '17, '19 – digital rendering vs robot trajectories

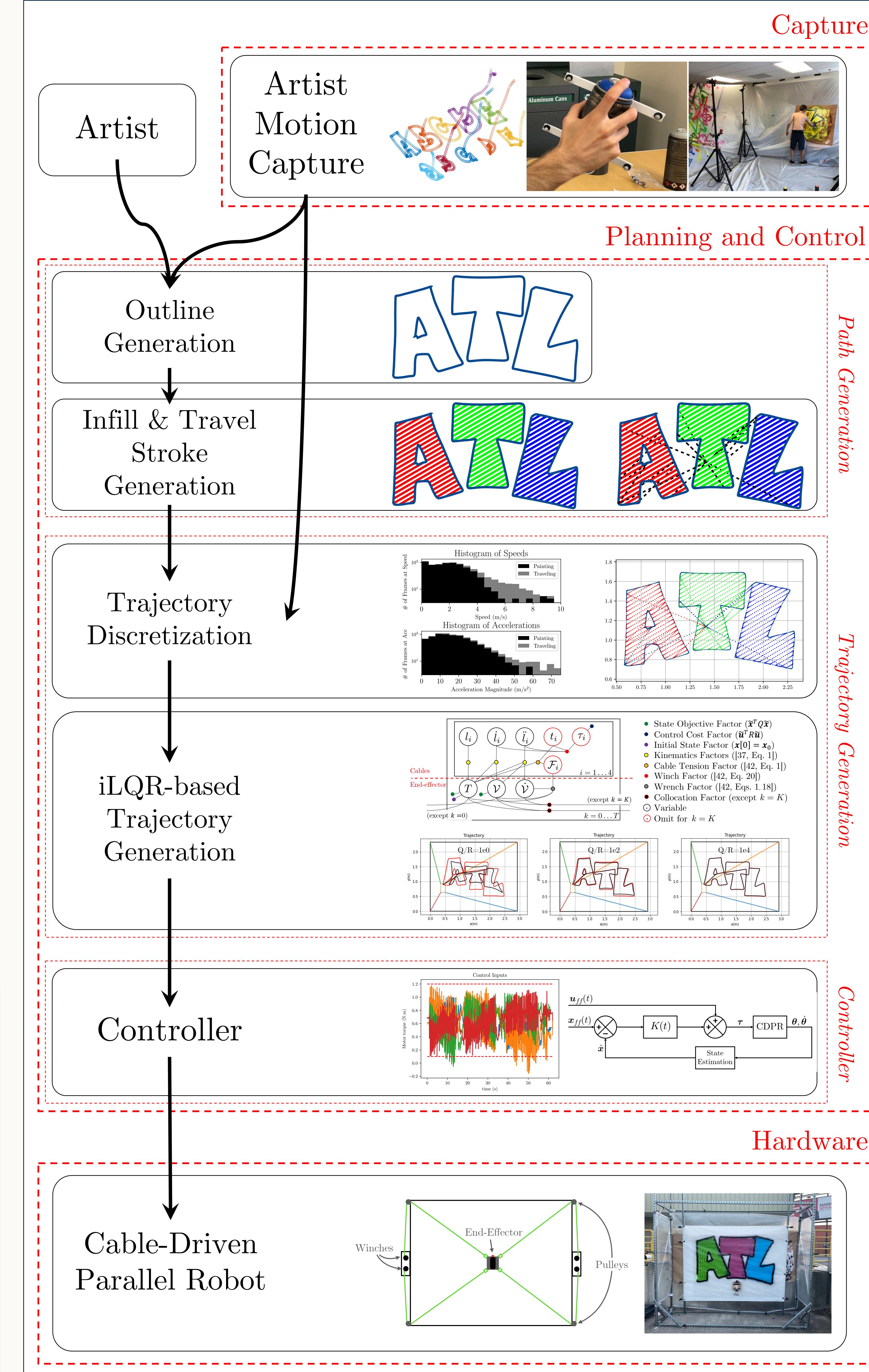
Objective

To paint graffiti in the style of a human artist, we must:

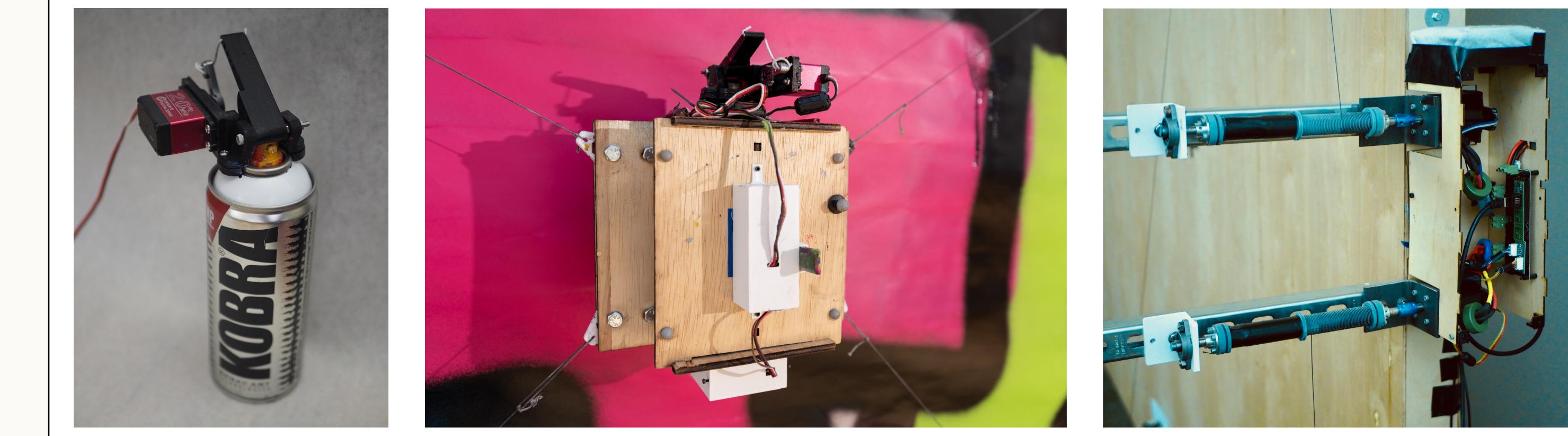
1. Sense: Capture how a human paints
2. Think: Perceive the artistic motions and plan how to reproduce
3. Act: Render the painting with a Cable-Driven Parallel Robot

Each of these 3 stages has interdependent requirements with the other stages, so we require a system-level approach.

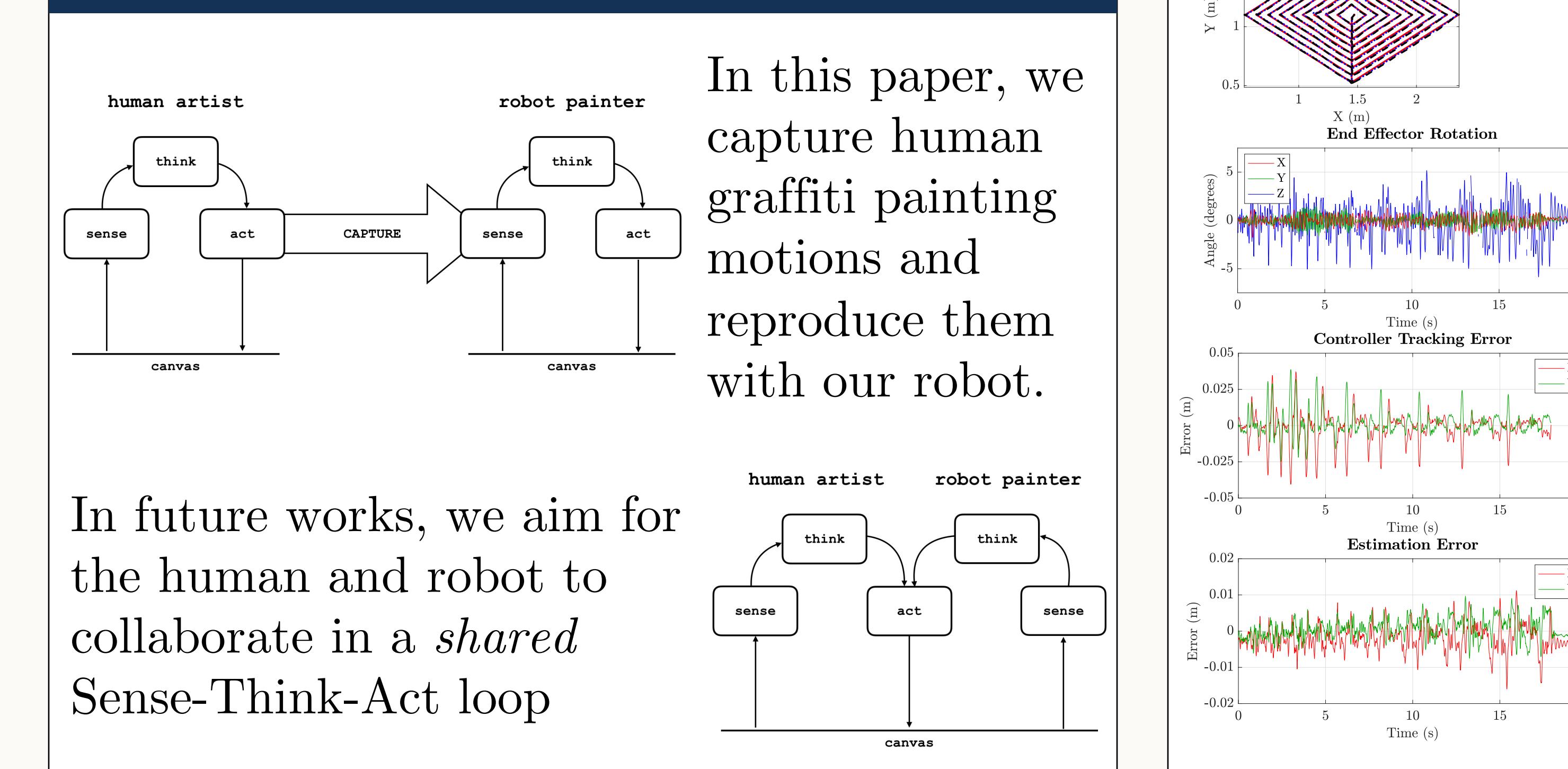
Approach



Results



Conclusions & Future Work



Selected References

- [1] N. Roy, "Graffiti robot - train writing - planet256 / Niklas Roy / the fly - wall printer style machine," https://www.youtube.com/watch?v=zSlvQsu27s&t=3s&ab_channel=ARTESANOBERLIN
- [2] A. Uryasheva, M. Kulbeda, N. Rodichenko, and D. Tsetserukou, "DroneGraffiti: Autonomous multi-UAV spray painting," in *ACM SIGGRAPH 2019 Studio*, ser. SIGGRAPH '19, New York, NY, USA: Association for Computing Machinery, 2019. [Online]. Available: <https://doi.org/10.1145/3306306.3328000>
- [3] "Albert robot muralist," <https://www.robotmuralist.com/albert>. [Online].