ROSS A. KNEPPER, PH.D.

- Technical leader who solves the hardest problems in motion planning and controls for autonomy.
- Passionate about building robot systems that help people solve real problems in their lives.
- Drawn to systems-level problems involving cross-functional collaboration and conflict resolution.
- Thrives in high-ambiguity situations and especially enjoys the intersection of people and tech.

WORK EXPERIENCE

Director of Planning and Controls, Tech Lead

Outrider Technologies January 2023 – Present

- Directed 3 teams that regularly delivered 1–2 high-priority features to customer sites per 2-week sprint.
- Designed and guided implementation of a multi-robot planning architecture for autonomous vehicles that resolved instability, reduced planning time by 99%, and increased team velocity by 400%.
- Created custom dashboard that focused the team on the biggest issues and decreased bug ticket backlog by 95%.
- Organized and led cross-functional technical working group that planned and resourced special projects. Achieved a 65% reduction in mission duration 2 months early.

Senior Applied Scientist

Amazon June 2020 – December 2022

- Developed new motion control system in a mission-critical feature that reduced error magnitude by 90%.
- Designed new software architecture to optimize motion controller for modularity, observability, and testability. Change immediately saved 1 month of development time.
- Created debug analytics tool for use in a production setting. After a motion planning failure, the tool published a visual report, reducing bug triage time by 95%.
- Used strategic and tactical decision-making to rapidly stand up new end-to-end autonomous functionality. Delivered project 2 months ahead of schedule, which enabled early hardware down-select that saved substantial cost.

Researcher, Instructor, Manager (Academic Career)

Cornell University (Assistant Professor) July 2014 – May 2020
Carnegie Mellon University, MIT July 2004 – June 2014

- Achieved international acclaim for expertise in motion planning, multi-robot algorithms, and human-robot interaction with 52 publications and 45 invited talks.
- Built and delivered intelligent robot system software for industry and government clients, earning repeat business.
- Developed the Lattice Planner, a motion planner for autonomous mobile robots, used worldwide to guide planetary rovers, autonomous vehicles, and warehouse robots.

CONTACT INFO

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SKILLS

Robotics:
motion planning | autonomous vehicles | motion control | probabilistic robotics | mobile robots | optimization | AI | simulation | human-robot interaction

Software engineering:
agile | testing | software architecture | prototyping | continuous improvement | code review | continuous integration | continuous deployment | root-cause analysis | system engineering

Leadership and management:
self-direction | coaching | mentoring | motivating people | project management | public speaking | written communication | providing feedback | conflict resolution | data-driven decision making | grit

Technologies:
C++ | C | Python | Bash | Jupyter | Numpy | Pandas | ROS | ROS2 | Jira | git | GitHub | Plotly | LaTeX | Linux

EDUCATION

Doctor of Philosophy (Ph.D.), Robotics
Bachelor of Science (B.S.), Computer Science
Carnegie Mellon University