

Aman Singh

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EDUCATION

Indian Institute of Science <i>Doctor of Philosophy in Cyber-Physical Systems</i>	Bengaluru, India August 2022 – Present
Indian Institute of Technology Roorkee <i>Bachelor of Technology in Mechanical Engineering</i>	Roorkee, India July 2015 – May 2019

PROFESSIONAL EXPERIENCE

Project Associate <i>RBCCPS, Indian Institute of Science</i> - Developed a high torque density actuator with applications in robots like biped, quadruped etc - Developed a chain-sprocket based 2R manipulator leg using the above actuators - Developed a 12 DOF highly dynamic quadruped robot named Stoch-3	Jan 2021 – July 2022 Bengaluru, India
Verification Engineer <i>Oski Technology</i> - Signed off Register Transfer Level designs of integrated circuits using formal verification - Verified an AXI interconnect connecting 10 AXI masters and 18 AXI slaves - Verified the resource management functionality of a block that receives custom instructions from 2 RISC-V cores	July 2019 – Jan 2021 Gurugram, India

SELECTED PUBLICATIONS

COMPAct: Computational Opt. & Automated Modular Design of Planetary Act. <i>A. Singh, D. Kapa, S. Joshi, and S. Kolathaya Paper-Link Video-Link</i>	ICRA 2026 Accepted
BiPathCPG: A Load-Sharing Design Arch. for Compound Planetary Gearboxes <i>D. Kapa*, A. Singh*, S. Vegesna, S. Joshi, M. Goswami, and S. Kolathaya (*equal contribution)</i>	2026 Submitted
A Co-Design FW for Energy-Aware Monoped Jumping, Detailed Act. Model <i>A. Singh, A. Mishra, D. Kapa, S. Joshi and S. Kolathaya Paper-Link Video-Link</i>	Humanoids 2025 Published
Comparison between ESSPG & ISSPG Actuators for Legged Robots <i>A. Singh, D. Kapa, P. Chedda, and S. N. Y. Kolathaya Paper-Link</i>	AIR 2025 Accepted
A Chain-Driven, Sandwich-Legged Quadruped Robot: Design and Exp. Analysis <i>A. Singh, B. G. Goswami, K. Nehete, and S. N. Y. Kolathaya Paper-Link Video-Link</i>	AIR 2025 Accepted

PATENTS

Low-cost sandwiched robotic leg design for legged locomotion <i>Aman Singh, Shishir Kolathaya Patent-certificate</i>	Indian Patent Office (IPO) Accepted
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PROJECTS AND COMPETITIONS

Human-Inspired Biped Walking Video Built a 2D biped test-bed & walking controller	Aug 2018 – Apr 2019
Compliant Robot Leg, Polytechnique Montreal Designed & built a compliant leg	May 2018 – Jul 2018
ABU Robocon 2018, Team Leader Video 7th/109 teams, Best Innovative Design award	Jun 2017 – Mar 2018
ABU Robocon 2017, Technical Member Built a mecanum-drive frisbee-throwing robot	Jun 2016 – Mar 2017

TECHNICAL SKILLS

Software Tools: MATLAB, SolidWorks, Ansys, ROS, Gazebo, PyBullet
Programming Languages: C++, Python, LaTeX

HONOURS AND AWARDS

MITACS Globalink Award, 2018: MITACS
OPJEMS Scholarship, 2016: O. P. Jindal Group

Improving Energy Efficiency of Direct-Drive Quadrupeds w/ Asym. Five-Bar Leg <i>D. Kapa, A. Singh, S. Ramesh, M. Plecnik, and S. Kolathaya</i>	2026 <i>Submitted</i>
BiPathCPG: A Load-Sharing Design Arch. for Compound Planetary Gearboxes <i>D. Kapa*, A. Singh*, S. Vegesna, S. Joshi, M. Goswami, and S. Kolathaya</i> (*equal contribution)	2026 <i>Submitted</i>
COMPAct: Computational Opt. & Automated Modular Design of Planetary Act. <i>A. Singh, D. Kapa, S. Joshi, and S. Kolathaya</i> Paper-Link Video-Link	ICRA 2026 <i>Accepted</i>
A Co-Design FW for High-Perf. Jumping of a Five-Bar Monoped w/ Act. Opt. <i>A. Mishra, A. Singh, and S. Kolathaya</i> Paper-Link	AIM 2026 <i>Accepted</i>
DTEA: A Dual-Topology Elastic Actuator w/ Series-Parallel Switching <i>V. Ramesh, A. Singh, and S. Kolathaya</i> Paper-Link	IROS 2026 <i>Accepted</i>
A Co-Design FW for Energy-Aware Monoped Jumping, Detailed Act. Model <i>A. Singh, A. Mishra, D. Kapa, S. Joshi and S. Kolathaya</i> Paper-Link Video-Link	Humanoids 2025 <i>Published</i>
Comparison between ESSPG & ISSPG Actuators for Legged Robots <i>A. Singh, D. Kapa, P. Chedda, and S. N. Y. Kolathaya</i> Paper-Link	AIR 2025 <i>Accepted</i>
A Chain-Driven, Sandwich-Legged Quadruped Robot: Design and Exp. Analysis <i>A. Singh, B. G. Goswami, K. Nehete, and S. N. Y. Kolathaya</i> Paper-Link Video-Link	AIR 2025 <i>Accepted</i>
Force Control for Robust Quadruped Locomotion: A Linear Policy Approach <i>A. Shirwatkar, V. K. Kurva, D. Vinoda, A. Singh, et al.</i> Paper-Link	ICRA 2023 <i>Published</i>
Dynamic Mirror Descent based MPC for Accelerating Robot Learning <i>U. A. Mishra, S. R. Samineni, P. Goel, C. Kunjeti, H. Lodha, A. Singh, et al.</i> Paper-Link	ICRA 2022 <i>Published</i>