

Kowndinya Boyalakuntla

Third-year Ph.D. student in Computer Science | Rutgers University

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Research interests

I work on learning and planning for robot manipulation and whole-body control. My current research explores action abstractions from human motion capture for planning with learned world models, and Q-guided recovery for frozen imitation policies, toward reliable humanoid loco-manipulation.

Education

Rutgers University

Sep 2024 – present

Ph.D. in Computer Science; GPA: 3.85/4.0 Advisor: Prof. Abdeslam Boularias

Rutgers University

2022 – 2024

M.S. in Computer Science; GPA: 3.8/4.0 Advisor: Prof. Abdeslam Boularias

Thesis: Context-Aware Entity Grounding with Open-Vocabulary 3D Scene Graphs.

Indian Institute of Technology Tirupati

Jul 2017 – Jul 2021

B.Tech. in Computer Science and Engineering; GPA: 8.42/10.0 Advisors: Prof. Sridhar Chimalakonda, Prof. Kalidas Yeturu

Manuscripts under review

1. PL-MPC: Beyond Policy Alignment: Closing the Planning–Learning Loop for Robot Control with Learned World Models

Kowndinya Boyalakuntla, Yuhan Liu, Abdeslam Boularias

Manuscript, 2026. Under review at ICRA 2027. [\[Paper\]](#) [\[Project\]](#) [\[Code\]](#)

2. TRACE: Plan-Conditioned Imitation for Robust Object Retrieval under Self-Occlusion in Dense Clutter

Kowndinya Boyalakuntla, Ajinkya Pawar, Abdeslam Boularias, Jingjin Yu

Manuscript, 2026. Under review at ICRA 2027. [\[Paper\]](#) [\[Project\]](#) [\[Code\]](#)

Ongoing research projects

Motion Abstractions for World-Model Planning

Ongoing

- Investigating action abstractions learned from human motion capture that let a planner choose motion and duration using a learned world model, with reference trajectories tracked by a closed-loop controller.
- Studying when these abstractions improve humanoid locomotion planning under matched time and compute budgets, toward long-horizon loco-manipulation.

Learning Recovery Proposals for Q-Guided Planning

Ongoing

- Exploring lightweight, behaviorally diverse recovery proposals around a frozen imitation policy, selected by a shared task-value critic and retained at deployment.
- Planning comparisons with Q-only selection, a single residual policy, and search without learned proposals to assess recovery, nominal-task performance, and repeated-search cost under matched interaction and compute budgets.

Research experience

Rutgers University

Jan 2023 – present

Graduate Student Researcher · New Brunswick, NJ

Research in robot learning, visual perception, and manipulation with Prof. Abdeslam Boularias. Work includes scene grounding, language-guided rearrangement, dynamic grasping, learned world models, and manipulation under self-occlusion.

RISHA Lab, IIT Tirupati

Dec 2019 – May 2022

Undergraduate Student Researcher · Tirupati, India

Research in empirical software engineering and human–computer interaction, including tools for evaluating software repositories and generating energy-aware mobile applications.

University of Waterloo

Jul 2020 – Sep 2020

Visiting Scholar · Waterloo, Canada

Improved RepoReaper for large-scale GitHub repository analysis, increasing recall and reducing false positives without relying on GHTorrent.

Teaching

Instructor, Rutgers University
CS440: Introduction to Artificial Intelligence Undergraduate course

Fall 2026

Peer-reviewed publications

1. **KARL: Kalman-Filter Assisted Reinforcement Learner for Dynamic Object Tracking and Grasping**
Kowndinya Boyalakuntla, Abdeslam Boularias, Jingjin Yu
IROS, 2025 [\[Paper\]](#) [\[Code\]](#)
2. **DAP: Diffusion-based Affordance Prediction for Multi-modality Storage**
Haonan Chang, Kowndinya Boyalakuntla, Yuhan Liu, Xinyu Zhang, Liam Schramm, Abdeslam Boularias
IROS, 2024 [\[Paper\]](#) [\[Code\]](#)
3. **LGMCTS: Language-Guided Monte-Carlo Tree Search for Executable Semantic Object Rearrangement**
Haonan Chang, Kai Gao, Kowndinya Boyalakuntla, Alex Lee, Baichuan Huang, Harish Udhaya Kumar, Jingjin Yu, Abdeslam Boularias
IROS, 2024 [\[Paper\]](#) [\[Project\]](#) [\[Code\]](#)
4. **Context-Aware Entity Grounding with Open-Vocabulary 3D Scene Graphs**
Haonan Chang, Kowndinya Boyalakuntla, Shiyang Lu, Siwei Cai, Eric Pu Jing, Shreesh Keskar, Shijie Geng, Adeeb Abbas, Lifeng Zhou, Kostas Bekris, Abdeslam Boularias
CoRL, 2023 [\[Paper\]](#) [\[Project\]](#) [\[Code\]](#)
5. **eGEN: an energy-saving modeling language and code generator for location-sensing of mobile apps**
Kowndinya Boyalakuntla, Marimuthu Chinnakali, Sridhar Chimalakonda, Chandrasekaran Kalicheti
ESEC/FSE, 2022 [\[Paper\]](#) [\[Code\]](#)
6. **RepoQuester: A Tool Towards Evaluating GitHub Projects**
Kowndinya Boyalakuntla, Meiyappan Nagappan, Sridhar Chimalakonda, Nuthan Munaiah
ICSME, 2022 [\[Paper\]](#) [\[Code\]](#)
7. **GitQ-towards using badges as visual cues for GitHub projects**
Akhila Sri Manasa Venigalla, Kowndinya Boyalakuntla, Sridhar Chimalakonda
ICPC, 2022 [\[Paper\]](#) [\[Code\]](#)
8. **A Platform for Large Scale Auto Annotation of Scanned Documents Featuring Real-Time Model Building and Model Pooling**
Prashanth Komuravelli, Kowndinya Boyalakuntla, Vijay Chilaka, Teja Dande, Vidya Rodge, Ramya Velaga, Reena Abasaheb Deshmukh, Kalidas Yeturu
CVIP, 2021 [\[Paper\]](#) [\[Code\]](#)

Honors & awards

2022 Project showcase, IInvenTiv All IITs R&D Fair. Research project advised by Prof. Kalidas Yeturu, showcased at IIT Delhi.
2019 Gold Medal, Inter IIT Technical Meet 8.0. Ashoka's Tech for Change Challenge at IIT Roorkee; high-preparation event among 20 IITs.

Leadership & mentoring

Google Developer Student Clubs, IIT Tirupati
Community Lead

Feb 2019 – Jul 2020

Organized 12 workshops and hackathons for more than 70 students; led 15 mentoring sessions on Flutter and Android.

Technical skills

Programming: Python, C++

Robotics and learning: PyTorch, TensorFlow, OpenCV, PyBullet, Isaac Gym, ROS, Kornia

Visualization: Three.js

Professional service & activities

Reviewer: IROS (2025, 2026); CoRL (2026); IJRR (2026); ICAPS (2026).

2021 Developed an Android application for IIT Tirupati's convocation.

2020 Completed 80 hours of National Service Scheme service; developed the IIT Tirupati NSS website and led its maintenance team.