

UiO : **Department of Informatics**
University of Oslo

ROBIN seminar - Robotics and AI research news 2023



Robotic foundation models news

RT-2: Vision-Language-Action Models Transfer Web Knowledge to Robotic Control

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Google DeepMind. Authors listed in alphabetical order, with contributions listed in Appendix A.



<https://robotics-transformer2.github.io/>

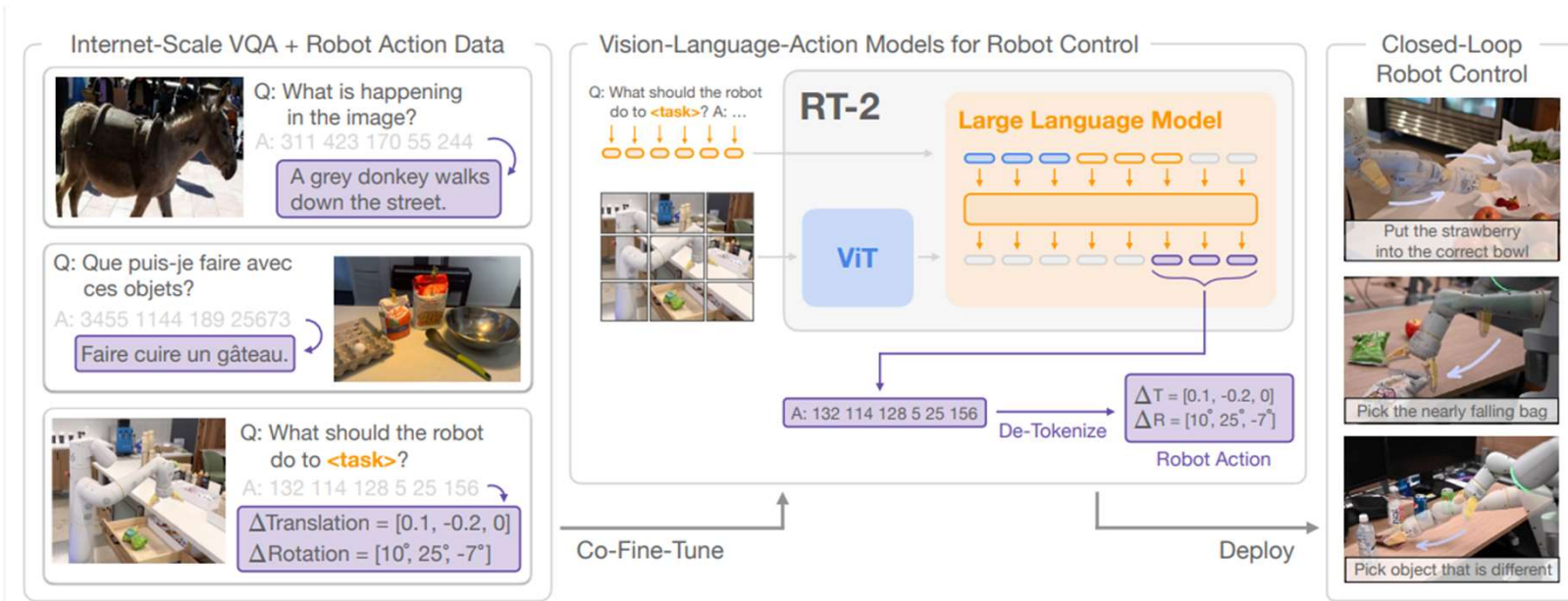


Figure 1 | RT-2 overview: we represent robot actions as another language, which can be cast into text tokens and trained together with Internet-scale vision-language datasets. During inference, the text tokens are de-tokenized into robot actions, enabling closed loop control. This allows us to leverage the backbone and pretraining of vision-language models in learning robotic policies, transferring some of their generalization, semantic understanding, and reasoning to robotic control. We demonstrate examples of RT-2 execution on the project website: robotics-transformer2.github.io.

[Submitted on 25 Sep 2023]

Extreme Parkour with Legged Robots

Xuxin Cheng, Kexin Shi, Ananye Agarwal, Deepak Pathak

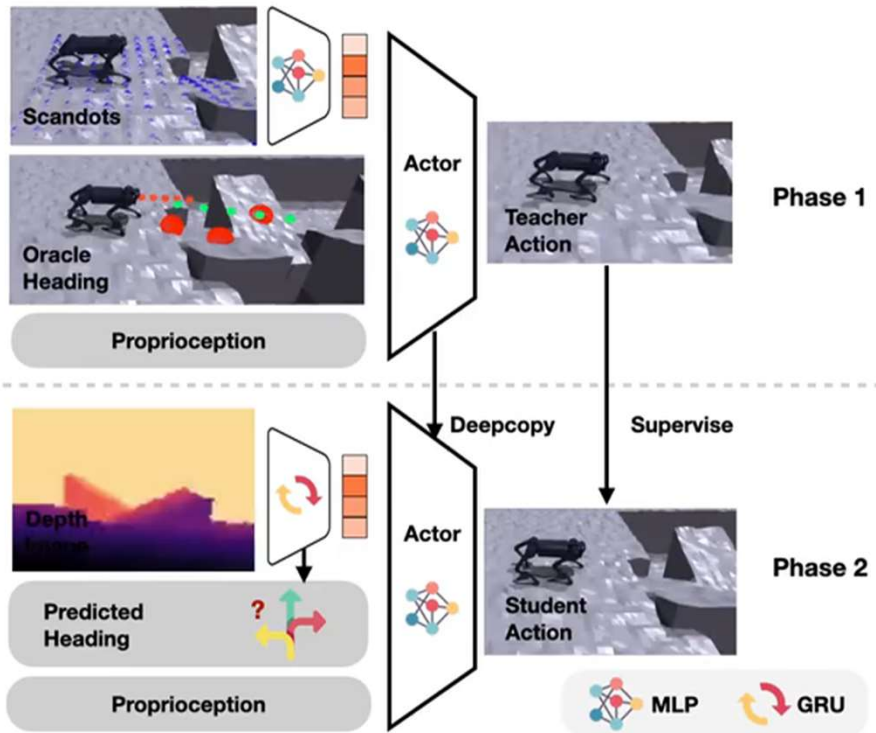
CoRL: Quadruped parkour (CMU)

<https://extreme-parkour.github.io/>





Quadruped parkour

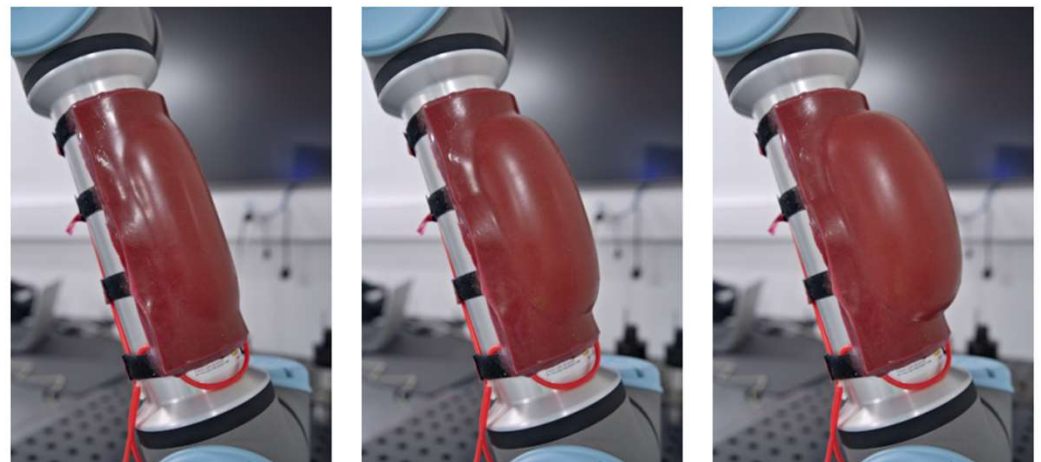
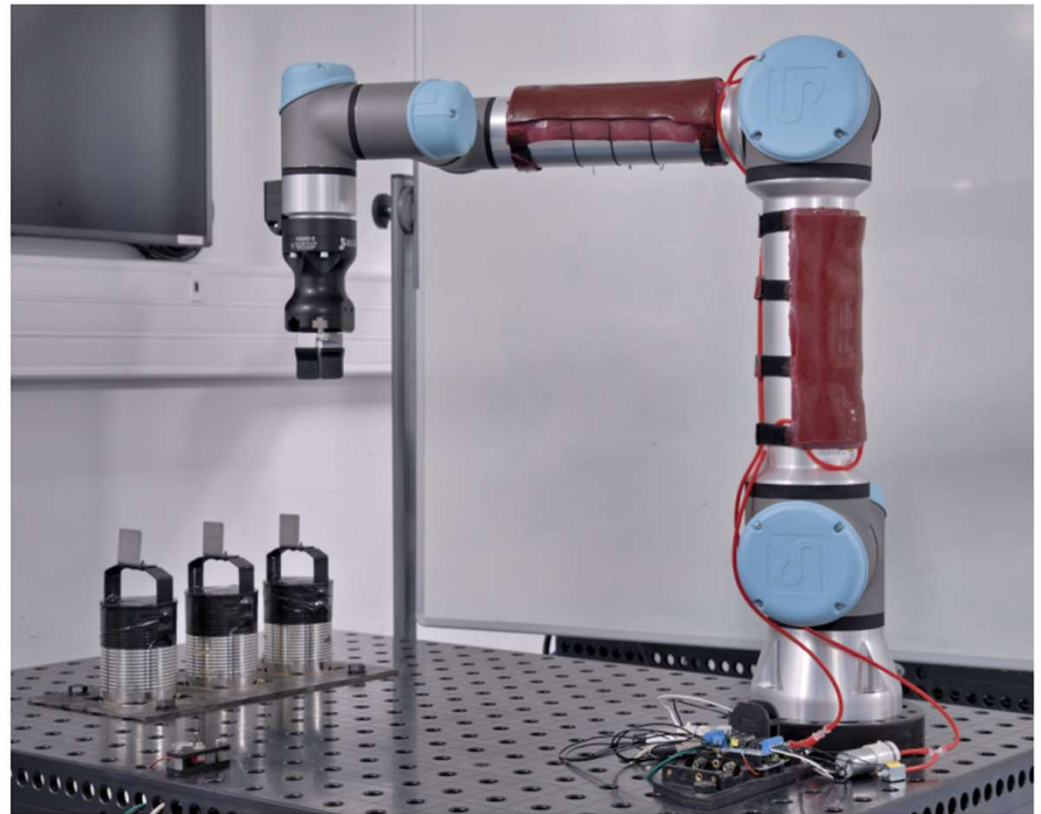


- Single end-to-end NN
- Vision backbone + policy
- ROA
 - Regularized online adaptation
- Train 20hrs RTX3090
- Run Jetson NX 50Hz

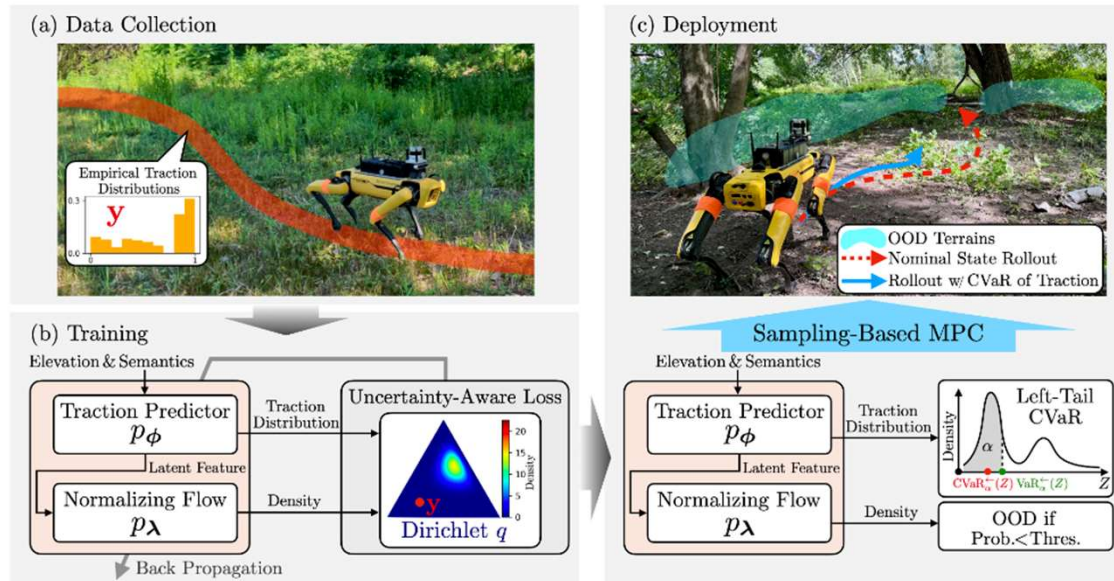
Figure 2: Training overview. In phase 1, we use RL to learn a locomotion policy with access to privileged information like environment parameters and scandots [2] in addition to heading direction from waypoints. We use Regularized Online Adaptation (ROA)[9] to train an estimator to recover environmental information from the history of observations. In phase 2, we distill from scandots into a policy that operates from onboard depth and *automatically decides its heading (yaw) direction* conditioned on the obstacle.

RO-MAN: BioMORF Soft robotic skin robot (SDU)

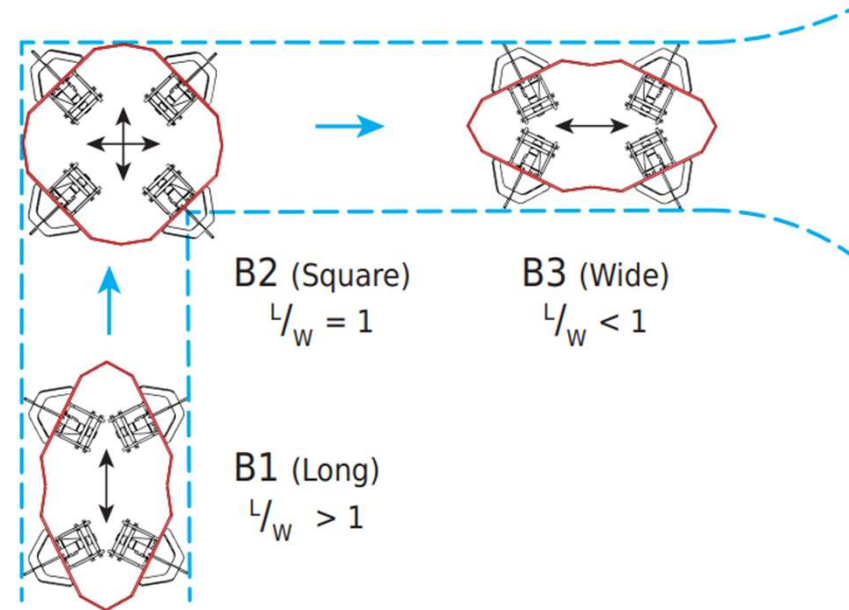
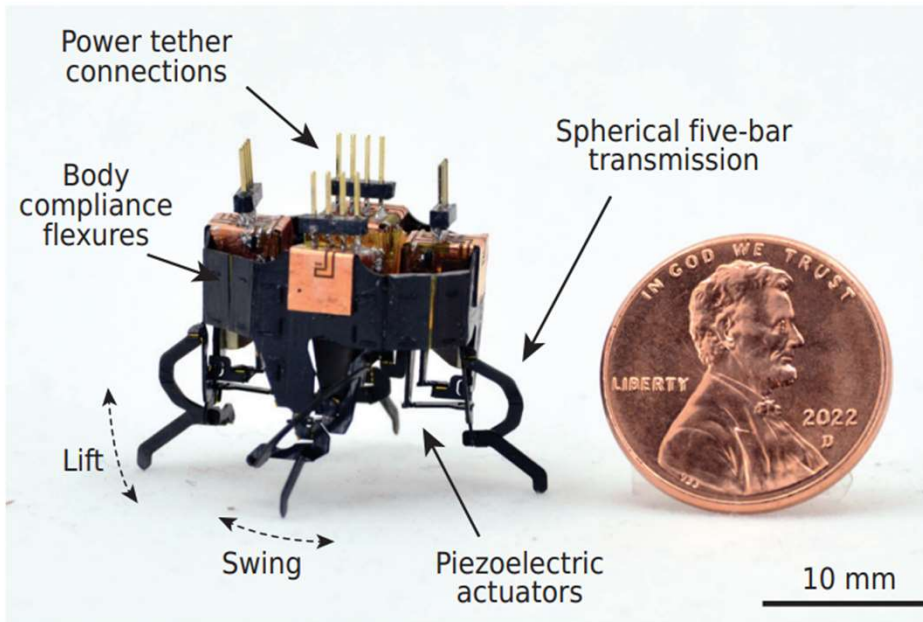




IROS: **EVORA**: Deep Evidential Traversability Learning for Risk-Aware Off-Road Autonomy



Overview of the **EVORA uncertainty-aware traversability learning and risk-aware navigation** pipeline. To handle *aleatoric uncertainty*, **EVORA** learns empirical traction distributions and uses the conditional value at risk (CVaR) of traction to forward simulate robot states. To handle *epistemic uncertainty*, **EVORA** estimates the densities of traction predictor's latent features to identify and avoid out-of-distribution (OOD) terrains.



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Vision-controlled jetting for composite systems and robots

[Thomas J. K. Buchner](#), [Simon Rogler](#), [Stefan Weirich](#), [Yannick Armati](#), [Barnabas Gavin Cangan](#), [Javier Ramos](#), [Scott T. Twiddy](#), [Davide M. Marini](#), [Aaron Weber](#), [Desai Chen](#), [Greg Ellson](#), [Joshua Jacob](#), [Walter Zengerle](#), [Dmitriy Katalichenko](#), [Chetan Keny](#), [Wojciech Matusik](#)  & [Robert K. Katzschmann](#) 

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Humanoid robot platforms for everyone?



Unitree H1



Fourier intelligence GR1