

Ameya Pore

ALTAIR Robotics laboratory, Department of Computer Science, UNIVR, Italy

☎ (+39) 3516211400 | ✉ ameya.pore@univr.it | 📱 Ameyapores | 📧 ameya-pore

Research Interest

- **Representation learning** for robotic control
- **Shared autonomy** for robotic Reinforcement Learning (RL)

Experience/ Research Projects

PhD Thesis: ALTAIR Robotics laboratory, Department of Computer Science, UNIVR

Verona, Italy

ADVISOR- PROF. PAOLO FIORINI, PROF. ALICIA CASALS

Oct. 2019 - Aug. 2023

- **Constrained RL** and **formal verification framework** to guarantee 100% safety adherence.
- Development of **Levels of Autonomy** for shared control in surgical robots
- One of the first frameworks for Deep RL based **robotic manipulation of deformable objects**
- Learning surgical gestures from a small set of human demonstrations

Master's thesis: Computer Vision and Autonomous systems group

Glasgow, UK

ADVISOR- DR. GERARDO ARAGON-CAMARASA

May 2018 - Apr. 2019

- Developed a **hierarchical RL** approach for robotic pick-and-place task that **improved generalisation** and reduced training steps by 90% compared to end-to-end RL methods

Internship: Mechanobiology Institute (MBI), National University of Singapore

Singapore

SUPERVISOR- DR. RONEN ZAIDEL-BAR

Jan. 2017 - Aug. 2017

- Modelling **embryonic cell movements** for body axis formation via RL
- Experimental Validation through **live cell imaging** (Spinning disk confocal microscopy)

Undergraduate Research, Epigenetics Lab

Pune, India

SUPERVISOR- PROF. SANJEEV GALANDE

Aug. 2016 - Apr. 2018

- Biomechanics of **tissue regeneration** to investigate the change in physical properties in complex structure formation.

Education

University of Verona (UNIVR)

Verona, Italy

PH.D. IN COMPUTER SCIENCE

Oct. 2019 - Aug. 2023

- Awarded the **Marie Skłodowska-Curie fellowship** under the ATLAS project by European Union's Horizon 2020 research and innovation programme.

Universitat Politècnica de Catalunya (UPC)

Barcelona, Spain

PH.D. IN BIOMEDICAL ENGINEERING

Oct. 2019 - Aug. 2023

- Secondary institute for co-tutelle doctoral studies.
- Passed with *cum laude* distinction

University of Glasgow

Glasgow, UK

M.S. IN COMPUTING SCIENCE

May 2018 - Apr. 2019

- Awarded **Erasmus+** International mobility fellowship (12 months)
- CGPA- 9.3/10

Indian Institute of Science Education and Research (IISER), Pune

Pune, India

B.S. IN LIFE SCIENCES

Aug. 2014 - Apr. 2018

- Awarded **INSPIRE fellowship** by Department of Science and Technology, India
- CGPA- 8.4/10

Skills

Computing

- *Relevant Courses:* **Reinforcement learning, Deep Unsupervised learning**, Robotics Foundations, Computer Vision, surgical robotics, Statistical Analysis, Probability theory
- *Frequently used Libraries:* **Pytorch, OpenAI gymnasium, Stable-baselines3**, tensorflow, OpenCV, Scikit-learn, Numpy, Pandas, matplotlib
- *Advanced proficiency:* **Unity3D, Python, C#, ROS, SOFA**, Da Vinci Resolve, GIMP
- *Intermediate proficiency:* R Studio, Matlab, Blender, Meshlab, LLM chatbots, Diffusion models

Biology

- **Relevant Courses:** Cell Biology, Developmental biology, Biophysics, Epigenetics, Molecular Biology
- **Used techniques:** Confocal microscopy, Atomic force microscopy, PCR, gel electrophoresis, Molecular Cloning, embryonic injections, DNA extraction

Soft skills

- **Languages:** English = Marathi > Hindi > Italian
- **Relevant Courses:** IP protection, Design thinking, Problem solving and critical thinking, communication
- **Commonly used:** Presentation skills, project management

Notable Achievements

- Invited by the **Office of the President of India**, New Delhi: One of the ten university representatives selected throughout India to present at the Innovation Festival, Mar. 2018.
- **Team lead:** Secured funding of **1M USD** for setting up an **incubation center** at IISER Pune, Oct 2019

Events

06/2023	Lead organizer , Hamlyn Symposium on Medical Robotics (HSMR2023) Workshop: Autonomous flexible robots	London
06/2023	Poster presentation , Reinforcement Learning Summer School (RLSS)	Barcelona
10/2022	Paper presentation , Int. Conf. on Intel. Rob. and Sys. (IROS2022)	Kyoto
06/2022	Paper presentation , Hamlyn Symposium on Medical Robotics (HSMR2022)	London
04/2022	Paper presentation , Conf. on Comput. and Robot Assisted Surgery (CRAS2022)	Napoli
10/2021	Paper presentation , Int. Conf. on Intel. Rob. and Sys. (IROS2021)	Virtual
11/2021	Paper presentation , Int. Sym. Med. Robot. (ISMR2021)	Atlanta
07/2021	Poster Presentation , ETH Robotics Summer School and Symposium (RSS2021)	Zurich
10/2020	Paper presentation , Int. Conf. on Intel. Rob. and Sys. (IROS2021)	Virtual
06/2020	Paper presentation , Int. Conf. Rob. and Autom. (ICRA2020)	Virtual
12/2020	Attendee , Conf. Neur. Inf. Proces. Sys. (NeurIPS2020)	Virtual
07/2020	Best project , Summer School on tissue segmentation, modelling and deformation	Virtual
12/2019	Runner-up , Hamlyn Winter School, Imperial College London	London
09/2019	Poster Presentation , Summer School on Surgical robots, Montpellier	Montpellier

Selected publications

- Pore Ameya, et al. "Autonomous Navigation for Robot-Assisted Intraluminal and Endovascular Procedures: A Systematic Review", IEEE Transactions on Robotics (2023)
- Pore Ameya, et al. "Safe Reinforcement Learning using Formal Verification for Tissue Retraction in Autonomous Robotic-Assisted Surgery", 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2021.
- Pore Ameya, et al. "Soft Tissue Simulation Environment to Learn Manipulation Tasks in Autonomous Robotic Surgery", 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2020 (* - equal contribution)
- Pore Ameya, et al. "On simple reactive neural networks for behaviour-based reinforcement learning", 2020 IEEE International Conference on Robotics and Automation (ICRA2020)

Extracurricular Activity

Entrepreneurship

Pune, India

CO-FOUNDER AND FORMER HEAD OF THE ENTREPRENEURSHIP CELL, IISER PUNE

May 2016 - May 2018

- Organiser of various events such as **Startup Weekend Pune**, Coffee with a startup, Workshops on Design thinking, rural innovation and prototyping.
- Mentored small scale projects such as detecting Rail track defects autonomously, tracking vaccination, algorithm to detect dry eye syndrome etc.

Other

- **Dance** Intermediate level dancer in Cuban Salsa and Bachata
- **Social**- Former coordinator of DISHA, a non-profit organization for teaching under-privileged children
- **Sports**- Basketball, Cricket, Chess (ELO:1500)
- **Music**- Learnt Tabla (Indian classical instrument) for 7 years