Arthur Fender Coelho Bucker

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ABOUT ME

I am a passionate roboticist and AI researcher. My previous projects and research focus mainly on the field of AI, Robotics, and autonomous systems.

WORK AND RESEARCH EXPERIENCE

Munich Institute of Robotics and Machine Intelligence — Research intern

[Oct 2021 – Current]

Led a research project in collaboration with Microsoft Research (US) in the field of Human-Robot Interaction. The goal was to develop a system able to map natural language interactions into Trajectory changes. The approach developed is agnostic of the robotic form factor and works on top of generic motion planners. Our results were published at the IROS2022 conference and presented as a Spotlight contribution at ICRA2022 workshop on Collaborative Robots and the Work of the Future. A follow-up paper was also presented at the NeurIPS2022 workshop on Foundation Models for Decision Making Workshop and submitted to ICRA2023 (pending).

Carnegie Mellon University - Researcher Intern

[May 2020 – Oct 2020]

Conducted 2 researches at AirLab CMU on the field of AI and Robotics. Achieving 2 publications at IEEE -ICRA 2021: “Coordinating Multiple Aerial Cameras for Robot Cinematography” (1st author) and “Learning semantic control space for expressive robot cinematography” (2nd author).

Link: https://arthurfenderbucker.github.io/publications/

International Product Development

[Aug 2018 – May 2019]

Technical leadership on an interdisciplinary group of 8 master students from USP and Aalto University (Finland) for the development of a Hydro Acoustics Localization and Communication System for Divers. The project, sponsored by SAAB, was developed with a budget of €10.000.

Link: https://arthurfenderbucker.github.io/porfolio/Hydro-acoustic_localizer

CITI USP, Brazil — Research intern

[Aug 2018 – May 2020]

Applied concepts of distributed networks and swarm intelligence in embedded systems for sea turtle life monitoring and organic sensing. The project was developed in partnership with project Tamar.

Link: https://arthurfenderbucker.github.io/porfolio/Internet_of_Turtles_-_Distributed_traking_System

Grupo Turing AI — Head of project management

[Feb 2018 – Aug 2018]

A group with the goal of studying, applying, and disseminating Artificial Intelligence Knowledge.

Managed the group members on the development of several AI projects. As a group member, I led or participated in projects on fields of computer vision (Hepatic carcinoma outcome prediction, Brazilian sign language simultaneous translation), Natural Language Processing (political thermometer of Brazilian Politicians on social media), and Evolutionary Algorithms (autonomous players of Pong and Tetris).

Group member (Jan, 2017 - dec, 2020)

Link: https://arthurfenderbucker.github.io/porfolio/robotic_hand

Skyrats, Autonomous Drones — Member

[Oct 2018 – Sep 2020]

Group of Autonomous drones design of the University of São Paulo

Responsible for developing computer vision and AI solutions for embedded systems and autonomous Drones. In addition to working on the hardware and electronics design.

Captain of the indoor team at IMAV 2019 Madrid - International Micro Air Vehicle Competition.

Link: https://arthurfenderbucker.github.io/porfolio/IMAV

AB InBev, Brazil — Summer intern

[Jan 2018 – Mar 2018]

Worked for 2 months with computer vision solutions for product identification, Business Intelligence and predictive analytics at the Logistics and Distribution Center of AB InBev.

EDUCATION

Techniche Universität München

[Oct 2020 – Current]

M.Sc. Mechatronics and Robotics

Double degree with the University of São Paulo

University of São Paulo

[Jan 2017 – Current]

B.Eng. Mechatronics Engineering

AWARDS

Spotlight contribution - IEEE 2022 ICRA workshop on Collaborative Robots and the Work of the Future

[2022 – 2022]

Fellow at Fundação Estudar

[Jul 2020 – Current]

Leaders program (approval rate = 0.05%)

Merit scholarship recipient (AUCANI)

[2021 – 2021]

Selected among the best students approved studies abroad

Summer Exchange in China (Huawei)

[15 Oct 2019 – 3 Nov 2019]

Seeds for the Future program

Winning Team at Hackathon Ambev

(Hack the World 2017 SP)

Best project award and Team leader

at PACE POLI USP 2017 Competition (1st out of 200 teams)

Brazilian Robotics Olympics Finalist

A representative of the State of São Paulo at the national stages of the Brazilian Robotics Olympics

(team leader 2015 & 2016)

Silver medal in the national Theoretical Robotics Olympics (2016)

Team gold medal at the "International Olympiad Mathématiques sans frontières" (2016)

PUBLICATIONS

Reshaping Robot Trajectories Using Natural Language Commands: A Study of Multi-Modal Data Alignment Using Transformers

[2022 – 2022]

Published in *IROS 2022 conference | IEEE 2022 ICRA workshop on Shared Autonomy in Physical Human-Robot Interaction | IEEE 2022 ICRA workshop on Collaborative Robots and the Work of the Future | Northwest Robotics Symposium 2022*

Link: https://arxiv.org/pdf/2203.13411.pdf

LATTE: LAnguage Trajectory TransformEr

[2022 – 2022]

Published in *NeurIPS 2022 workshop - Foundation Models for Decision Making Workshop*

Submitted to ICRA2023 conference

Link: https://arxiv.org/pdf/2203.13411.pdf

Do You See What I See? Coordinating Multiple Aerial Cameras for Robot Cinematography

[2021 – 2021]

Published in *IEEE International Conference on Robotics and Automation (ICRA 2021)*

Links: https://arthurfenderbucker.github.io/publication/Coordinating_Multiple_Aerial_Cameras_for_Robot_Cinematography | https://arxiv.org/abs/2011.05437 | https://youtu.be/Qq_dRGNAUMs

Batteries, camera, action! Learning a semantic control space for expressive robot cinematography

[2021 – 2021]

Published in *IEEE International Conference on Robotics and Automation (ICRA 2021)*

Links: https://arthurfenderbucker.github.io/publication/Learning_a_semantic_control_space_for_expressive_robot_cinematography | https://arxiv.org/abs/2011.10118 | https://www.youtube.com/watch?v=aN3kGDRo0XE

Graph Neural Networks for Improved El Nino Forecasting

[2020 – 2020]

Published in NeurIPS 2020 workshop on Tackling Climate Change with Machine Learning & EGU2021 (Proposal paper)

Links: https://arthurfenderbucker.github.io/publication/Graph_Neural_Networks_for_Improved_El_Nino_Forecasting | https://arxiv.org/abs/2012.01598

LANGUAGES

Portuguese - Native

English - Fluent

German - Intermediate

French - Basic

Chinese - Basic