

Bassel El Mabsout



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PUBLICATIONS

Mabsout, B.*, Mysore, S.*, Saenko, K., & Mancuso, R. (2021a). How to train your quadrotor: A framework for consistently smooth and responsive flight control via reinforcement learning. *ACM Trans. Cyber-Phys. Syst.*, 5(4). <https://doi.org/10.1145/3466618>

Mabsout, B.*, Mysore, S.*, Saenko, K., & Mancuso, R. (2021b). Regularizing action policies for smooth control with reinforcement learning. *2021 IEEE International Conference on Robotics and Automation (ICRA)*, 1810–1816. <https://doi.org/10.1109/ICRA48506.2021.9561138>

Mysore, S., **Mabsout, B.**, Mancuso, R., & Saenko, K. (2021). Honey. i shrunk the actor: A case study on preserving performance with smaller actors in actor-critic rl. *2021 IEEE Conference on Games (CoG)*, 01–08. <https://doi.org/10.1109/CoG52621.2021.9619008>

* Authors contributed equally

SELECTED PROJECTS

Stochastic dynamics learning (*BU/MIT*) In Progress
In order to learn a representation of the dynamics of a stochastic dynamical system, I wrote a Conditional Adversarial Network based algorithm which models the distribution of trajectories that such a system would take – [SOURCE](#)

Learning verifiable controllers (*BU/MIT*) In Progress
This project deals with the problem of training controllers for differentiable dynamics such that the controllers verifiably stabilize to a set-point with guaranteed performance via learned bounded Lyapunov functions – [SOURCE](#)

Live adaptation of learned quadrotor control (*BU*) In Progress
In this project, we are upgrading the Neuroflight tooling to support live-swapping a Neural-Network acting as a controller on a quadrotor. This would allow us to support training the flight controller while in flight

DRAT (*Compiler Construction – CS525*)
I wrote DRAT, an ML based programming language that implements a Hindley-Milner type system. It can be interpreted, compiled, and has a REPL. The compiler makes use of recursion schemes and an effect system so that different compilation stages are composable – [REPORT](#), [SOURCE](#)

Seizure Prediction (*Machine learning – CS542*)
My group participated in a [Kaggle competition](#) that aimed to accurately predict seizure activity in epileptic patients. Utilizing a combination of machine learning techniques, we got the best results with an AUC score of 0.92 – [PREPRINT](#)

Finding a NASH- ϵ Equilibrium (*Complexity Theory – CS535*)
This term paper simplifies an existing proof of the complexity class specifying the run-time of finding an approximate Nash equilibrium – [PREPRINT](#)

Haskell Blog
I created a Haskell blog on [IPFS](#) about programming language concepts such as automatic differentiation and dependently typed vector construction which garnered some interest and was featured on [Haskell News](#)

Face Tracking PID Ball Control (*Embedded Systems – CS654*)
This project involved writing a PID controller on an embedded system to stabilize a ball on a [touchscreen](#). It's position was then controlled with face tracking

Honda Ridesharing (*SAIL*)
In collaboration with BU's SAIL and Honda, we worked on privacy preserving (using [MPC](#)) preference based ride-sharing. My responsibilities were to define constraints such that users with similar preferences get pooled together

EDUCATION

2018 – **Doctor of Philosophy** COMPUTER SCIENCE
Boston University

2012 – 2015 **Bachelor of Science** COMPUTER SCIENCE
American University of Beirut

CURRENT COLLABORATORS

Renato Mancuso (Advisor) rmancuso@bu.edu
Chuchu Fan chuchu@mit.edu
Shahin Roozkhosh shahin@bu.edu
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Siddharth Mysore sidmys@bu.edu
Kate Saenko saenko@bu.edu

WORK EXPERIENCE

Meathouse (*Freelancer*) 2020 –
Created ScanMan, a barcode based inventory tracker acquired by Meathouse to solve long-standing supply chain inefficiencies

Zahera (*Cofounder - CTO*) 2018 –
Zahera is an app-based photo printing service currently installed on > 15000 devices. I worked on designing the products, building and improving the technologies used, and managing 2 developers

American University of Beirut (*Researcher*) 2016 – 2018
I wrote [neural-swarm](#), a collection of experimental optimization algorithms for learning decentralized swarm control in Haskell

CCC (*Software Developer*) 2015 – 2017
I worked on the core team of C3D, a leading 3D-based construction project control application. I implemented several key features, optimizations, and bug fixes in the java based application

SKILLS

PROGRAMMING LANGUAGES (by familiarity)	Haskell, Python, Java, Processing, SQL, (Java,Type)script, Coq, C, Nix, Elm, F#, Bash, Clojure, C++, ATS, C#, Matlab, Lean, GLSL
FRAMEWORKS & LIBRARIES	Tensorflow, Pytorch, Keras, Numpy, Scipy, Pandas, Spinning Up, Pybullet, Gurobi, React-Native, Expo, Megaparsec, Recursion-Schemes, Polysemy, Firebase
MARKUP	LaTeX, HTML, CSS, Markdown, XML
TOOLS	Git, Nix, GNU tools, Makefiles, Gazebo, ANTLR, Autocad, Photoshop, LabVIEW

OTHER ACADEMIC EFFORTS

PEER REVIEWED VENUES	ICRA, ROBOT, TJCA, EMSOFT, COG, DATE, ECRTS, RTSS
TEACHING PRESENTATIONS	I lectured as a TF for Data Science (CS506) BU's AIR, ICRA 2021, and CoG 2021

MISC

LANGUAGES	English, Arabic, French
NATIONALITIES	Lebanese and Portugese