Arnaud Klipfel
Resume

 Georgia Tech · Georgia Tech Lorraine · ENSTA Bretagne · French · 25 years old · 240 North Avenue NE · 30308 Atlanta, GA · USA · primary : aklipfel3@gatech.edu · secondary : arnaudklipfel@hotmail.com · personal and gatech · Arnaud Klipfel · Portfolio drop link and Website · +33 6 42203246/+1 470 662 3007

Education

Georgia Tech   **· January 2023 - Present**

Ph.D. in Electrical and Computer Engineering. Thesis topic in Robotics.

Georgia Tech   **· January 2020 - December 2022**

Master Thesis in Electrical and Computer Engineering. Thesis topic in Robotics. Double degree. GPA 4.0.

Georgia Tech Lorraine   **· August 2019 - December 2019**

Master in Electrical and Computer Engineering, focus on Robotics, AI, computer vision. Double degree. GPA 4.0.

ENSTA Bretagne   **· September 2018 - June 2019**

Graduate student at ENSTA Bretagne, a French Graduate and Post-Graduate Engineering School and Research Institute, Brest, France.

- French Engineering Degree, Master of Science equivalent (Double degree with Georgia Tech).

- Ranked 3/178.

- Specialization in Field Robotics, Automation, and Embedded Systems.

- Classes: Kalman Filtering, Bayesian Filtering, Mobile Robotics, NAO humanoid robots, Digital Image Processing, Linear and Non-linear Systems Control, Optimal Control, Simultaneous Localization And Mapping (SLAM), Robot design, ROS, OpenCV, Interval Analysis, Signal Processing, Network Science, Differential Equations, Finite Differences, Calculus of Variations, Statistics and Probability, Computer Science, Digital and Analog Electronics, C, C++, OS, CAD, Project Management.

ENSTA Bretagne   **· September 2017 - June 2018**

Undergraduate student at ENSTA-Bretagne. Generalist year. Relevant courses: *Matlab*, *Python*, Signal Processing, Electronics, Automation, Sensors, Mechanics, Mathematics. Ranked 2/172.

Lycée Kléber   **· 2014-2017**

Lycée Kléber, Strasbourg, France, intensive post secondary school preparation in advanced Mathematics and Science for the competitive entrance examinations to French Graduate Engineering Schools.

Séminaire de Jeunes   **· 2014**

High school Séminaire de Jeunes de Walbourg, Walbourg, France, Scientific «Baccalauréat » obtained with highest honors.

Robotics skills/toolbox

Programming Languages/libraries	Proficient: Python, Matlab, Arduino,LaTeX Good: c++, c, Pytorch Knowledge: Html, CSS, Ruby, Asm, TensorFlow, java.
Robotics Middlewares	ROS, Drake
Robotics Simulators	VREP, Gazebo, RaiSim, Isaac Sim
Gym environments	Isaac Gym, RaiSim
CAD	SolidWorks, Catia.
OS	Linux (Ubuntu), Mac OS. Good debugging, programming skills on Unix platforms.
Hardware Platforms	RC-car, NAO humanoid robot, Georgia Tech Robotarium, Kuka iiwa manipulator mounted on a Clearpath mobile base, Parrot drone, ENSTA-Bretagne DART robot (wheeled robot), A1 and Aliengo (quadrupeds).

Research Experience

Graduate Research Assistantship position · **Spring 2021 - Present**

Master Thesis · **Spring 2020 - December 2022**

Supervised by Dr. Seth Hutchinson, and Dr. Sehoon Ha.

- Implementation of visual tracking using visual servoing on a 9 DOFs mobile manipulator. Report available here. Used Drake for middleware.

- Deep Reinforcement Learning for legged locomotion: implementation of a general, morphology-agnostic learning framework. Using RaiSim (c++, python) and PyTorch for simulation and training. Implementation of the *Policies Modulating Trajectory Generator* on Aliengo, deployed on A1. (supplementary material). Thesis available here.

- Learning a Single Policy for Diverse Behaviors on a Quadrupedal Robot using Scalable Motion Imitation. (link)

Special Problem · **Fall 2019**

Special Problem in Robotics and Computer Vision, supervisor : Dr. Cedric Pradalier. The Special Problem focused on the review and implementation of an existing homography observer applied to image stabilization for the Jaco2 robotic arm. A Matlab library was implemented for simulation tests. Archive available here.

Visiting Student at Dalhousie University, Halifax, Canada · **June 2019 - August 2019**

Built a multi-target tracking robot using an old RC-car, stereo vision, and Deep Learning. Report available here. Github repositories: version 1, version 2.

- The RC car had to be rebuilt and adapted to fit the needs of the tracking process.

- Designed the hardware architecture of the robot. The middleware ROS was used to supervise the interactions between hardware and software.

- Integrated and adapted several neural networks for object tracking. Implementation in Python, used OpenCV for image processing.

Bosch GmbH · **June 2018 - August 2018**

Two-month internship in the Research and Development unit at *Bosch GmbH* in Germany, Bühlertal. Development of a multipurpose test platform for electronic wipers from an Arduino Due. Porting of the software of an Arduino Mega to an Arduino Due microcontroller. Report and evaluation available here.

- Applied the working process of technical product development, and research. Conducted tests on both hardware and software, elaborated development strategies.

- Accountable for a part of the programming. Programming in C/C++.

Teaching Experience

Teaching Assistant for CS4649A/7649A Robot Intelligent Planning · **Fall 2020**

Supervised by Dr. Matthew Gombolay. Class covers motion planning, convex optimization techniques, Reinforcement learning. Graded assignments, projects (codes, final reports), and held 2 office hours. Implemented Reinforce, AC, A2C. (supplementary material)

One-month Humanitarian mission · **Summer 2013**

Collaborated with the Séminaire de Jeunes de Walbourg to organize the trip, to order vaccines, and to raise funds. Tutored more than one-hundred students aged 10 to 15 years old in mathematics. Contributed to build a school in the city of *Imasgo*, Africa, Burkina Faso.

Projects

Distributed coverage algorithms applied to distributed target tracking - Robustness evaluation · **Fall 2020**

Final project of ECE6563 Networked Control. Implementation and study of coverage algorithms for swarms of robots. Real world experiment with the Robotarium of Georgia Tech. Report, videos, and code available here. Code implemented in Matlab.

Deep Learning for Image segmentation · **Fall 2019**

Digital Image Processing (ECE6258). Final term project : Robustness evaluation of the VGG16 U-NET to real world conditions in the case of semantic segmentation.

Field Robotic Competition: ERL2019 · **September 2018 - June 2019**

European Robotic League 2019: aerial and ground robots interaction applied to the exploration of devasted areas. Reports available here.

- Designed and programmed both aerial and ground robots along with one other teammate in order to make the autonomous vehicles work and communicate. Motion planning using Potential Fields and A*, ROS for middleware, and ROS SLAM packages for mapping and localization.

- Coordinated the workflow and agenda of the project as team leader.

Design of an electronic travel aid for visually impaired people · **2017**

TIPE: an engineering project for the entrance examinations to French Graduate Engineering Schools. Built a low-cost electronic travel aid system for blind people using the principle of a rear parking aid. (supplementary material)

- Programmed a *Pyboard* microcontroller in python.

- Worked along with the association of partially impaired people in Strasbourg, France, to define the requirements.

Languages

French · **Native speaker**

English · **TOEIC (2018): 850, GRE (2019): Verbal:146, Quantitative: 155, Essay: 3**

- Able to understand written and spoken English, have a fluent conversation in English, write a report, and give a presentation in English.

- Since Spring 2020: full-time student residing in the USA.

- Unofficial GRE transcripts (2019).

- Summer 2019: two-month internship in Halifax, Nova Scotia, Canada, at Dalhousie University.

German · **CEFR B2**

- Able to understand written and spoken German, have a conversation in German, write a report, and give a presentation in German.

- June-August 2018: two-month immersive internship at *Bosch GmbH*, Bühlertal, Germany. Learned to collaborate and work in German along with a German research-engineer.

Publications

Learning a Single Policy for Diverse Behaviors on a Quadrupedal Robot using Scalable Motion Imitation

Arnaud Klipfel, Nitish Sontakke, Ren Liu, Sehoon Ha Submitted to IROS 2023 website

Hobbies

Rock climbing, Trekking, trailing, hiking, camping, mounting PCs.