

Chloé Benz

AEROSPACE + AUTONOMOUS SYSTEMS & ROBOTICS ENGINEER

Fresh graduate from a dual Master's program. Research experience in GNSS navigation. Looking for an entry level position.



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EDUCATION

- 2020-2022 **ILLINOIS INSTITUTE OF TECHNOLOGY – DUAL DEGREE PROGRAM** Chicago, IL, United States
Master of Science with thesis (advisor: Pr. Boris Pervan)- Autonomous Systems and Robotics
 - **Teaching Assistant in Advanced Mechanics of Solids & Fluid Dynamics** | Fall 2020, Spring 2021
 - **Thesis** | *Carrier Phase Multipath Characterization and Frequency-Domain Bounding*Coursework include: Modern Control, SLAM, Optimal State Estimation & Kalman Filtering, Machine Learning, Computer Vision, Data Driven Modelling, Sensor Fusion
- 2018-2020 **ISAE-ENSMA – DUAL DEGREE PROGRAM** Poitiers, France
Diplôme d'Ingénieur – Mechanical, Materials and Aerospace Engineering
 - **Member of ISAE-ENSMA's student association** | Planned and supervised on-campus events, organized the homecoming weekend with a budget of 70,000 € – 2019/2020Coursework include: Automatic Control, Signal Processing, Aerodynamics, Mechanics, Fluid Mechanics, Introduction to Flight Dynamics, Structures, Materials, Optimization, Orbital Mechanics, Classical Dynamics
- 2016-2018 **LYCEE KLEBER** Strasbourg, France
Two-year intensive program in preparation for highly selective entrance exams to Engineering Schools
Coursework include: Algebra, Topology, Calculus, Statistics, Electronic Circuits and Power Electronics

EXPERIENCE

- 2021 – 2022 **NAVIGATION LABORATORY @ ILLINOIS INSTITUTE OF TECHNOLOGY** Chicago, IL, United States
Research Assistant, under the supervision of Pr. Boris Pervan
 - Developed a single antenna, dual frequency carrier phase multipath characterization method meant for airborne applications, designed to provide a precise frequency-domain upper bounding model valid over time
 - Automated calls to Fortran and Python routines from MATLAB main script, allowing all data processing steps requiring external simulation results to be run from a single command
- Jun. – Sept. 2020 **SCHOOL OF COMPUTER SCIENCE** Birmingham, United Kingdom – *Conducted remotely*
Junior Research Engineer, under the supervision of Dr. Mohan Sridharan
 - Designed a restaurant knowledge domain and minimal planning module in CR-Prolog SPARC for an autonomous agent to plan customer-oriented tasks
 - Collaborated on coding a Python communication module to transform real-world observations to knowledge and translate them to goals for real-time reasoning in an environment simulated with PyBullet

PROJECTS

- 2022 **PLANT WATERING SYSTEM [ONGOING]**
- Engineer and build an autonomous plant watering system using an ESP-32 development board with WiFi and clock-based pump triggering
- 2022 **PORTFOLIO WEBSITE [ONGOING]**
- Deploy a portfolio website in React using Gatsby framework, integrate a gallery with pictures hosted on AWS
- 2021 **NEURAL NETWORK ACCELERATOR**
- Reimplemented a tensor linear algebra library in C++ interfaced with Python to dissociate syntax from computation speed, achieving 0.99 NumPy time in tensor convolution operations
- 2021 **3D SLAM FOR INDOORS UAV**
- Implemented a 3D SLAM based on simulated noisy LiDAR and accelerometer readings to locate both ground landmarks and UAV in Python, testing a custom particle-based EKF, achieving 10 cm precision on a 10 m³ room
- 2021 **CHEEZAM**
- Scraped images from Google Images using Python to construct a 5-cheeses dataset of about 1,800 images
 - Trained a classifier using TensorFlow, achieving more than 80% accuracy on dataset featuring similar looking cheeses, using VGG-16 architecture and data augmentation techniques
- 2020 **RETRACTABLE WINGS DISASTER RESPONSE UAV**
- Designed and 3D modeled a robust rack and pinion wing retraction system on Fusion360 as a 2-students team, leading to about 50% wingspan reduction in retracted mode
 - Sourced materials and electronic components for easy and large-scale manufacturing
- 2019 – 2020 **BLACK-OUT CHALLENGE - *Semi-finalist for Safran Electronics and Defense's Black-Out Challenge***
- Formalized and pitched a low cost, low energy consumption navigation solution to a prolonged GNSS shutdown for ground vehicles based on a dead-reckoning module recalibrating itself using fixed beacons and nearby users' smartphones BLE signals, easily scalable and rapidly deployable
 - Prototyped an IMU/OBD-II dead-reckoning module using an ESP-32 microcontroller achieving meter level drift on a 2 minute field test at speeds < 50 km/h
- 2019 **TEXAS HOLD'EM POKER BOT**
- Led a 4-students team on implementing a poker playing bot in Ada
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SKILLS & INTERESTS

Spoken Languages:

- **French** | Native language
- **English** | Bilingual – TOEIC:985/990, TOEFL:110/120, GRE:316/340 (159V, 157Q, 4.0A) – 2020
- **Japanese, Spanish, German** | Basics

Programming Languages, Software, Skills:

- **Python, CATIA, LaTeX, Microsoft Office Suite** | Advanced
- **Ada, C++, MATLAB, TensorFlow/Keras, CR-Prolog SPARC, Git, GitHub, FreeCAD** | Intermediate
- **Fortran, React, SQL, Bash, PyTorch, Fusion 360** | Basics

Extracurricular activities:

- **Dance and Performing Arts** | Performed in large scale events such as *Lion's Club* fundraisers, taught teams of 5-10 dancers from 2019 to 2022, choreographed for ISAE-ENSMA's graduation show
- **Analog and Digital Photography, Gaming**