# Edouard Castets

Machine and Deep Learning & Autonomous Systems Engineer

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## EDUCATION

**Illinois Institute of Technology** – Chicago, IL, USA (August 2022)
Master of Engineering in Aerospace Engineering – Machine Learning and Autonomous Systems
(Double degree program)
Relevant coursework : Machine & Deep Learning, Tensor Calculus, Autonomous Systems, Optimization, Data Analysis, Cybersecurity

**ISAE-ENSMA** – Poitiers, France (August 2022)
*Diplôme d'Ingénieur (equivalent to Master's degree) in Aeronautical Engineering*
Relevant coursework : Tensor Calculus, Signal Processing, Embedded Systems, Probabilities, Differential Calculus, Autonomous Systems, Data Managing, Computer Science (C++, Python, ADA)

## TECHNICAL SKILLS

**Languages:** Python, C#, C++, Javascript, HTML, SQL, Matlab, ADA

**Technologies:** Pytorch, Pandas, Numpy, Scipy, React JS, Linux, Protocol TCP/IP, Source Control(Git), Protocol BLE, Azure Storage & Active Directory, Computer Vision (OpenCV & Torch Vision), Docker

**Software:** Unity (Mixed Reality Toolkit), CAD (Catia V6, Fusion 360), Office (VBA), Adobe Premiere, MAMP, Deep Face Lab

**Hardware:** Raspberry PI, HoloLens 2, Data Collection devices (Empatica E4, Pupil Core Device)

## EXPERIENCE

**Civil Engineering Laboratory** – Illinois Institute of Technology (January 2022 - September 2022)
Research in Machine and Deep Learning

- Built multiple Deep Learning models to assess users' cognitive abilities during problem-solving tasks in an augmented reality environment.
- Organized data collection on students (created an application for augmented reality environment, HoloLens 2), learned about data ethics.
- Built data collection system for real-time collection and inference.
- Published a research paper (ICCCBE 2022).

**Skills:** Deep Learning, Python, Unity (MRTK), C#, Python, Network, Embedded Systems, Research Methods.

**Student Committee** – ISAE-ENSMA (2020 - 2021)
Student life organization

- Organized events for 400 students.
- Managed Sponsors.
- Developed communication and entertainment tools for students during the pandemic (Discord and Website).

**Skills:** Communication, Interpersonal skills, JavaScript, HTML, PHP.

## PROJECTS

**Rose flower & Pokemon Generator**

- Web-Scrapped a dataset of rose flower.
- Trained Generative Adversarial Networks DC-GAN & W-GAN with multiple trainings to create roses and Pokemons in 64 and 256 pixels.
- Developed a Mini-Batch Discrimination Layer in Pytorch.

**Blood Volume Pulse with motion artifact treatment (work in progress)**

- Building a network that predicts heart rate from a blood volume pulse signal contaminated by motion artifact using Fast Fourier Transform and a Convolutional Neural Network.
- Building a network that denoises the blood volume pulse signal contaminated by motion artifact using AR filter spectrum and a Deconvolutional Neural Network.

**Object detection on satellite/UAV images for geolocation / geoint (work in progress)**

- Building a Faster-RCNN that detect object on an aerial image and development of a few-shot learning process to add categories to detect.

**Other projects in Deep Learning:** Turnover prediction for stores (for next 8 weeks) using LSTM, Image classification for faces and for drone images both based on GoogLeNet implementation, Optimization method in Deep Learning, Deep Fake.

## INTERESTS & MISCELLANEOUS

**Languages Spoken:** Native French speaker, fluent in English with 1 year spent in the USA (ETS TOIEC score 945/990 – C2 CECRL), Spanish (B1 CECRL)
**Interests:** New technologies, Cybersecurity, OSINT, Geopolitics, Swimming, Music, Video Games, Travel (USA, Ireland, Germany…)