Yoan Charpentier - Application for a PhD candidate position in Mathematics

Contact Information

63110 Beaumont, France | +33 789 891 091
ycharpentier | *ycharpentier.github.io*
yoan.charpentier@etu.uca.fr | ycharpentier

Interests

Clustering methods, dimension reduction, Bayesian statistics, statistical inference, Graph Theory

Education

Polytech Clermont, Aubière, France **September 2022 - 2025 (expected)**

Engineering M.S. Mathematics Engineering and Data Science

- Specialty: Deep Learning (GAN, CNN, VAE) and Biostatistics (Survival Analysis)
- Relevant courses: Statistical Inference, Optimization, Algorithms, Graph Theory

Polytech Angers, Angers, France **2020-2022**

Preparatory Classes, Mathematics and Physics

- Relevant courses: Optics, Thermodynamics, Electronics, Chemistry, Analysis, Algebra

Estournelles de Constant, La Flèche, France **2019**

French Scientific Baccalaureate with high honours

- European Section : Mathematics in German
- Specialized in Engineering Sciences and Informatics

Research and Teaching Experience

Arctic University of Norway, Narvik, Norway

Research Internship **March - August, 2024**

Dissertation Topic: "How to plan the future e-trucks infrastructural network"
Creation of a model that jointly optimizes logistic infrastructure placement and the charging station placement so that electric trucks can drive along a logistic network.

- Wrote a state-of-the-art on covering models and infrastructure placement in a logistic chain
- Implemented such models in AMPL
- Supervised by Hao Yu, Github project link

Akkodis, Aubière, France

AI Internship in R&D department **June - July, 2023**

Introduction to research

- Made a literature search and a state of the art on Foundation Models and Semi-Supervised Learning. Identification of threats and opportunities of such models.
- Participated in Mosquito species recognition task challenge. Used computer vision techniques to detect and classify small objects using TensorFlow.

Polytech Angers, University of Angers, Angers, France

College Level Tutoring **December 2021 - March 2022**

Taught 16 hours of courses for students in preparatory classes at Polytech engineering schools under the supervision of the department head (Algebra, Applied Mechanics, Analysis, Physics)

Projects

Heart Failure Survival Analysis
Supervised by Anne-Francoise Yao **September, 2024 - January, 2025**

Survival analysis performed on heart failure follow-up study. Performed : Kaplan-Meier estimation, goodness-of-fit tests, Cox model, Decision Tree learning. Github project link

AI applied to Optimization
Supervised by Teddy Virin (Michelin) **October, 2024 - January, 2025**
Michelin project. Performed Bayesian optimization in a context of numerically modeling tires. Then, we used these parameters to train a car agent riding on a circular race circuit using the DDPG reinforcement learning algorithm. Github project link

Profiling Soccer Players' Positions
Supervised by Stéphanie Léger **September, 2023 - February, 2024**
Clustering of players' positional style. Provided additional information on the characteristics of positions in a football team by creating 'sub-positions'.

Project Monitoring (team of 7) **January - June, 2023**
Multifactor watch (legal, environmental, technical, economical, ...) on a customizable mechanical keyboard project. Entrepreneur First Prize (Clermont Auvergne PEPITE)

Niger Cartography
Supervised by Marie-Francoise Roy (University of Rennes 1) **January - June, 2022**
From a given database of Niger's facilities, our program generates an interactive map that represents the database (JavaScript, PHP, Nginx). Github project link.

Professional Experience

Crédit Agricole Centre France, Clermont-Ferrand, France
Data Miner **September, 2024 - 2025**
Work/study training program.
- Created appetency scores in SAS (model selection, hyperparameter optimization, model performance analysis)
- Applied machine learning techniques: variable selection, discretization, clustering, segmentation, logistic regression bagging
- Developed a Graph-based algorithm for variable selection
- Manipulated large data warehouses in SQL *(query optimization)*
- Communicated study results

Computer Skills

- **Python** (advanced use) including libraries SciPy, PyTorch, and TensorFlow
- **R** (advanced use) including libraries Survival, XGBoost, randomForest, and MASS
- Languages and Tools: SAS, SQL, Java, C++, Fortran, C, Git
- Algorithms:
  - Implementation in Python of several algorithms from Sedgewick Algorithm book (sort, search, graphs)
  - Experience programming Markov Chain Monte Carlo simulations of Bayesian posterior distributions in SAS
  - Thermic equations simulation in Fortran
  - Developped a PCA from scratch in R

References

- **Stéphanie Léger** : Associate Professor (machine learning, work/study program supervisor)
- **Pierre Druilhet** : Full Professor (statistical inference, Bayesian statistics)
- **Cedric Chauvière** : Associate Professor (applied deep learning)
- **Pierre Latouche** : Full Professor (advanced machine learning, artificial intelligence)
- **Anne-Françoise Yao Lafourcade** : Full Professor (survival analysis)

Involvments

- Class Delegate since 2022
- Environment: Ambassador for Ma Petite Planete, a worldwide environmental challenge game
- Treasurer for the Student's Business Office of Polytech Clermont (IDP Ingénierie)