# JEAN MERCAT

## AI Research Scientist

**I am looking to push the quickly evolving state-of-the-art in machine learning research and application to advance capabilities and understanding of large language models and multi-modal models.**

🎓 Scholar  @ jean.mercat@gmail.com  📞 +1 (669)-250-6406  📍 Mountain View, CA

## EXPERIENCE

### Machine Learning Research Scientist
**Toyota Research Institute**

📅 Jul 2021 - Present  📍 Los Altos, CA

- Research in LLMs, VLMs, and applications in Robotics
- Pre-training LLMs (up to 7B for 1T tokens), multi-modal models
- Manage interns and university collaborators
- 📖 **Publications** COLM 2024(in review) NeurIPS 2024, NeurIPS 2024, RSS 2024, NeurIPS 2023, CoRL 2022, ICRA 2022, ICLR 2022

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### 🎓 Ph.D. Road Scene Motion Forecasting
**Renault & Paris Saclay University**

📅 Sep 2017 – Mar 2021  📍 Paris

- Road scene **data analysis** and pre-processing
- **Neural networks** for time series (RNN, CNN, VAE, Attention)
- Research and applications
- 🏆 **First place** Argoverse Motion Forecasting Competition Won twice: NeurIPS 2019 and CVPR 2020
- 📖 **Publications** ArXiv, IQPC 2019, NeurIPS 2019, ICRA 2020

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### Data Engineer
**Inria**

📅 2017 (9 months)  📍 Bordeaux

- **C++/PostgreSQL** interface OOP
- **Medical data** processing (DICOM)
- Interdisciplinarity between **computer science** and **medicine**

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### Research Engineer
**Bordeaux University**

📅 2016 (12 months)  📍 Bordeaux

- **Image processing** in C++, Qt, Cimg
- Anisotropic annealing **simulation**
- Interdisciplinarity between **computer science** and **chemistry**
- 💻 **Teaching** 22h Fortran tutorial at ENSEIRB-MatMeca
- 📖 **Publication** Macromolecular rapid communications

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### Research Intern
**M2P2**

📅 2015 (6 months)  📍 Marseilles

- MPI Fortran HPC
- Lattice Boltzman **simulation**, two-phase fluid and solid interaction
- Interdisciplinarity between **computer science**, **physics** and **biology**
- 📖 **Publications** APS 2015, ICTAM 2016

## SKILLS

| LLM/VLM | Multi-node training |

| Machine Learning | Scientific Computing |

| Teamwork | Interdisciplinarity |

## FEAT. PUBLICATIONS

Linearizing Large Language Models First author, COLM 2024(under review)

Language models scale reliably with over-training and on downstream tasks NeurIPS 2024

DataComp-LM: In search of the next generation of training sets for language models NeurIPS 2024

## OPEN SOURCE

**GitHub**
**Contribution**: LLM training
**Pytorch:** Linearizing LLMs, Risk-Aware Prediction, Kalman Forecast
**C/C++:** MMG, LBM

🤗 Mamba-7b Mistral-SUPRA Risk Aware Prediction

## REFERENCES

*TRI Managers*: **Adrien Gaidon**
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*Ph.D. advisors*:
**Guillermo Pita Gil, Guillaume Sandou**
@ {guillermo@burro.ai,
  Guillaume.Sandou@centralesupelec.fr}

*Engineer jobs*: **Thierry Colin**
@ tcolin@sophiagenetics.com

*Internship*: **Julien Favier**
@ Julien.Favier@univ-amu.fr

## HOBBIES

| Paragliding | Audio books | Rock climbing |

| Science | DIY | Outdoors |