Francisco **Mena**

Master of Science · Computer Engineering

Kaiserslautern, Germany

famenatoro@gmail.com | Francisco-Mena-3 | Francisco Mena | fmenat | fmenat |
0000-0002-5004-6571 | fmenat14

About Me

My commitment is to contribute to the understanding of machine learning by identifying the capabilities and limitations of the learning models. At present, the computational complexity of current solutions has grown notably, requiring more resources and data for the proper learning of them. For this reason, it is necessary to propose models with different approaches, changing the perspective of solutions in different areas. Indeed, the solutions should not be based on human intervention (even in the form of labels), or domain-specific, that only works for particular domains and areas needing a careful choice of model type and architecture.

Education

PhD in Computer Science

Kaiserslautern, Germany

University of Kaiserslautern-Landau (RPTU) — *Apr. 2022 - Now*

- Thesis title: *Data Fusion in Multi-view Learning for Earth Observation Applications with Missing Views*.

Magíster en Ciencias de la Ingeniería Informática

Valparaíso, Chile

Federico Santa María Technical University (UTFSM) — *Mar. 2018 - Sep. 2020*

- Equivalent to *Master of Science in Computer Engineering*
- Thesis title: *Mixture Models for Learning in Crowdsourcing Scenarios*.
- Thesis description: The learning from crowds area was explored by using probabilistic model and neural networks. Specifically, two methods were proposed to learning from multiple inexpert annotations based on collective confusion patterns. A latent group variable model, with EM inference, was introduce in two setting of the learning from crowds problem. The results show that they are better for large-scale annotation scenarios, computationally (memory and temporal) and in inference (predictions).
- Grade Point Average: 94%.

Ingeniería Civil en Informática

Santiago, Chile

Federico Santa María Technical University (UTFSM) — *Mar. 2013 - Sep. 2020*

- Equivalent to *Computer Engineering*
- Grade Point Average: 80%.
- Top 10% on Class Rank. – Rank #4 of 66 students.

Licenciado en Ciencias de la Ingeniería Informática

Santiago, Chile

Federico Santa María Technical University (UTFSM) — *Mar. 2013 - Nov. 2017*

- Equivalent to *Bachelor of Science in Computer Engineering*
- Records linked to "*Ingeniería Civil en Informática*"

Honors & Awards

2022	**PhD Scholarship**, RPTU in Kaiserslautern	*2022-present*
2019	**Incentive Program for Scientific Initiation (PIIC)**, Federico Santa María Technical University	*2019-2020*
2018	**Master program scholarship**, Federico Santa María Technical University	*2018-2020*
2013	**Honor Roll**, *Institutional excellence*, Federico Santa María Technical University	*2013*

Publications

Peer-Reviewed Articles in Journal

Common practices and taxonomy in deep multiview fusion for remote sensing applications

IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Francisco Mena, Diego Arenas, Marlon Nuske, Andreas Dengel — *Feb. 2024*

DOI 10.1109/JSTARS.2024.3361556

On the quality of deep representations for Kepler light curves using variational auto-encoders

MDPI Signals

Francisco Mena, Patricio Olivares, Margarita Bugueño, Gabriel Molina, Mauricio Araya — *Oct. 2021*

DOI 10.3390/signals2040042

Harnessing the power of CNNs for unevenly-sampled light-curves using Markov transition field

Astronomy and Computing

Margarita Bugueño, Gabriel Molina, **Francisco Mena**, Patricio Olivares, Mauricio Araya — *Mar. 2021*

DOI 10.1016/j.ascom.2021.100461

Interpretable and effective hashing via Bernoulli variational auto-encoders *Intelligent Data Analysis*
Francisco Mena, Ricardo Ñanculef, Carlos Valle *Dec. 2020*
DOI 10.3233/IDA-200013

Collective annotation patterns in learning from crowds *Intelligent Data Analysis*
Francisco Mena, Ricardo Ñanculef, Carlos Valle *Dec. 2020*
DOI 10.3233/IDA-200009

Classical machine learning techniques in the search of extrasolar planets *CLEI Electronic Journal*
Francisco Mena, Margarita Bugueño, Mauricio Araya *Dec. 2019*
DOI 10.19153/cleiej.22.3.3

Peer-Reviewed International Conference Proceedings

Impact assessment of missing data in model predictions for Earth observation applications *IGARSS, IEEE*
Francisco Mena, Diego Arenas, Marcela Charfuelan, Marlon Nuske, Andreas Dengel *Oct. 2024*
https://arxiv.org/abs/2403.14297

A comparative assessment of multi-view fusion learning for crop classification *IGARSS, IEEE*
Francisco Mena, Diego Arenas, Marlon Nuske, Andreas Dengel *Oct. 2023*
DOI 10.1109/IGARSS52108.2023.10282138

Self-supervised Bernoulli autoencoders for semi-supervised hashing *CIARP, Springer*
Ricardo Ñanculef, **Francisco Mena**, Antonio Macaluso, Steffano Lodi, Claudio Sartori *Jan. 2022*
DOI 10.1007/978-3-030-93420-0_25

Revisiting machine learning from crowds a mixture model for grouping annotations *CIARP, Springer*
Francisco Mena, Ricardo Ñanculef *Oct. 2019*
DOI 10.1007/978-3-030-33904-3_46

A binary variational autoencoder for hashing *CIARP, Springer*
Francisco Mena, Ricardo Ñanculef *Oct. 2019*
DOI 10.1007/978-3-030-33904-3_12

Refining exoplanet detection using supervised learning and feature engineering *CLEI, IEEE*
Margarita Bugueno, **Francisco Mena**, Mauricio Araya *Oct. 2018*
DOI 10.1109/CLEI.2018.00041

Research funding

2020 **Investigator**, DGIP PI_M_17_6, Federico Santa María Technical University (UTFSM) *Chile*
2019 **Research Assistant**, BASAL FB-0008, Advanced center for Electrical & Electronic Engineering (AC3E) *Chile*
2017-2018 **Research Assistant**, FONDEF IT15I10041, Chilean Virtual Observatory (ChiVO) *Chile*

Experience

German Research Centre for Artificial Intelligence (DFKI) *Kaiserslautern, Germany*
Student Research Assistant at DFKI *Mar. 2022 - Now*
- Working together with PhD on Earth Observation data for crop yield prediction.
- **Technologies**: Python, Confluence, Jira, Teams, OneDrive, Gitlab, QGIS, and Slurm.

Federico Santa María Technical University (UTFSM) *Santiago, Chile*
Academic *2014 - 2021*
- (Lecturer) Computational Statistics, 2 times, since 2020.
- (Lecturer) Artificial Neural Networks, 1 time, in 2020.
- (Teacher Assistant) Computational Statistics, 2 time, since 2019.
- (Teacher Assistant) Artificial Neural Networks, 3 time, since 2018.
- (Teacher Assistant) Machine Learning, 3 time, since 2017.
- (Teacher Assistant) Fundamentals of Operations Research, 3 time, since 2017.
- (Laboratory Assistant) Mathematics, 1 time, in 2014.

Federico Santa María Technical University (UTFSM) *Santiago, Chile*
Research Assistant at Chilean virtual Observatory (ChiVO) *Jul. 2017 - May 2018*
- Professional practice as research assistant on different astroinformatics projects.
- **Technologies**: Jupyter Notebook, FITS, Python and Slurm.
- Working on the astronomical data reduction of ALMA and ESO observatories, and the creation of astronomical datasets.

Farmacia Las Rosas S.A. *Santiago, Chile*
Front-end & Back-end Developer *Jan. 2017 - Mar. 2017*
- Industrial practice as a desktop application developer.
- **Technologies**: Python, QT and Excel.
- Some operational functions of the pharmacy were automated.

Skills

Computer	Python, Keras, PyTorch, Jupyter Notebook, LaTeX, , C++, C, R, Sony Vegas
Personal	Teamwork, Communication, Organized, Responsibility
Languages	Spanish (Native), English (IELTS 7.0)

References

Ricardo Ñanculef jnancu@inf.utfsm.cl, *Informatics Department*, Federico Santa María Technical University.
Mauricio Araya mauricio.araya@usm.cl, *Electronics Department*, Federico Santa María Technical University.
Marlon Nuske marlon.nuske@dfki.de, *Smart Data & Knowledge Services*, German Research Centre for Artificial Intelligence.
Claudio Sartori claudio.sartori@unibo.it, *Department of Computer Science and Engineering*, University of Bologna.