

# María Alfaro Contreras

PHD IN COMPUTER SCIENCE · RESEARCHER @ MITEK SYSTEMS

Alicante, Spain

✉ m.alfaro@ua.es | 🌐 mariaalfaroc | 📺 mariaalfaroc | 🎓 María Alfaro-Contreras

## Education

### PhD in Computer Science, Cum Laude

Alicante, Spain

UNIVERSITY OF ALICANTE

Oct. 2020 - Sep. 2023

- Spanish Ministry of Universities competitive PhD FPU grant (FPU19/04957): awarded first place
- “New approaches to optical music recognition” supervised by Jorge Calvo-Zaragoza
- Visiting researcher at the Johannes Kepler University Linz to work on cross-modal music information retrieval projects

### MSc in Telecommunication Engineering, 9.54/10

Alicante, Spain

UNIVERSITY OF ALICANTE

Sep. 2018 - Jul. 2020

- “Optical music recognition for homophonic scores with neural networks and synthetic music generation” supervised by Jorge Calvo-Zaragoza
- 7 distinctions, one of them in the end-of-master project
- Best academic record of my class

### Bachelor in Sound and Image in Telecommunication Engineering, 9.11/10

Alicante, Spain

UNIVERSITY OF ALICANTE

Sep. 2014 - Jul. 2018

- “Building a reference corpus for optical music recognition” supervised by José M. Iñesta
- 21 distinctions, one of them in the end-of-degree project
- Best academic record of my class

## Experience

### Mitek Systems

Barcelona, Spain

RESEARCHER

March 2024 - Present

- Working on (check) fraud detection
- Implementation of Deep Learning models for text recognition and object detection

### University of Alicante

Alicante, Spain

PRE-DOCTORAL RESEARCHER

Oct. 2020 - Feb. 2023

- Spanish Ministry of Universities competitive PhD FPU grant (FPU19/04957): awarded first place
- Researcher in music information retrieval projects
- Published at several conferences and indexed journals
- Teaching assistant in bachelor courses
- Supervision of end-of-degree projects about Deep Learning applications

### Pattern Recognition and Artificial Intelligence Group

Alicante, Spain

STUDENT INTERN

Jan. 2019 - Jul. 2020

- University of Alicante grant recipient to develop my end-of-master project
- Worked on extending the musical textures that Deep Learning-based Optical Music Recognition models could handle
- Published at two conferences (IbPRIA & MEC) as first author

### Pattern Recognition and Artificial Intelligence Group

Alicante, Spain

STUDENT INTERN

Sep. 2017 - Jun. 2018

- Spanish Ministry of Education grant recipient to develop my end-of-degree project
- Implemented a music sheet generator to train Deep Learning-based Optical Music Recognition models

## Skills

<b>Machine Learning</b>	Image and/or audio transcription (OCR, HTR, OMR, A2S) · CNN, RNN, Transformer
<b>Machine Learning Frameworks</b>	PyTorch, TensorFlow, Keras, Scikit-learn, NumPy, Pandas
<b>Programming</b>	Python, LaTeX, C, C++, MATLAB
<b>DevOps</b>	Docker
<b>Languages</b>	Spanish (native), English (fluent), French (notions)



## Awards

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- 2019 **2nd Place**, XVIII Spanish National “Certamen Universitario Arquímedes” Competition *Madrid, Spain*
- 2019 **1st Place (Engineering Category)**, Valencian Region Academic Records Awards *Valencia, Spain*
- 2019 **1st Place**, “Cátedra Santander-UA de Transformación Digital” End-of-Degree Project Awards *Alicante, Spain*
- 2018 **3rd Place (Sound and Image Category)**, National Telecommunication COITT Awards *Madrid, Spain*

## Selected Publications

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- Alfaro-Contreras, M., Ríos-Vila, A., Valero-Mas, J.J., Calvo-Zaragoza, J. **A TRANSFORMER APPROACH FOR POLYPHONIC AUDIO-TO-SCORE TRANSCRIPTION**, in: *ICASSP Conference (Accepted)*. 2024. 
- Martínez-Sevilla, Juan C., Alfaro-Contreras, M., Valero-Mas, J.J., Calvo-Zaragoza, J. **INSIGHTS INTO END-TO-END AUDIO-TO-SCORE TRANSCRIPTION WITH REAL RECORDINGS: A CASE STUDY WITH SAXOPHONE WORKS**, in: *INTERSPEECH Conference*. 2023. 
- Alfaro-Contreras, M., Valero-Mas, J.J., Iñesta, J.M., Calvo-Zaragoza, J. **LATE MULTIMODAL FUSION FOR IMAGE AND AUDIO MUSIC TRANSCRIPTION**. *Expert Systems with Applications*. 2023. 
- Alfaro-Contreras, M., Ríos-Vila, A., Valero-Mas, J.J., Calvo-Zaragoza, J. **FEW-SHOT SYMBOL CLASSIFICATION VIA SELF-SUPERVISED LEARNING AND NEAREST NEIGHBOR**. *Pattern Recognition Letters*. 2023. 
- Alfaro-Contreras, M., Ríos-Vila, A., Valero-Mas, J.J., Iñesta, J.M., Calvo-Zaragoza, J. **DECOUPLING MUSIC NOTATION TO IMPROVE END-TO-END OPTICAL MUSIC RECOGNITION**. *Pattern Recognition Letters*. 2022.
- Alfaro-Contreras, M., Rizo, D., Iñesta, J.M., Calvo-Zaragoza, J. **OMR-ASSISTED TRANSCRIPTION: A CASE STUDY WITH EARLY PRINTS**, in: *ISMIR Conference*. 2021.

## Program Committees

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- 2024 **Reviewer**, ICASSP Conference *Seoul, Korea*
- 2023 **Organizer & Reviewer**, IbPRIA Conference *Alicante, Spain*
- 2022 **Organizer**, ELLIS Doctoral Symposium *Alicante, Spain*

## References

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- Ichiro Fujinaga** [ichiro.fujinaga@mcgill.ca](mailto:ichiro.fujinaga@mcgill.ca)
- Gerhard Widmer** [gerhard.widmer@jku.at](mailto:gerhard.widmer@jku.at)
- Jorge Calvo-Zaragoza** [jcalvo@dlsi.ua.es](mailto:jcalvo@dlsi.ua.es)