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# Melani Sánchez García

## Contact information:

### Current position:

Postdoctoral Researcher at  
Bionic Vision Lab  
University of California,  
Santa Barbara

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### Current Address:

2104 Harold Frank Hall  
Santa Barbara  
93106-5110, California

## INTERESTS AND OBJECTIVES

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My main area of interest lies on Computer Vision and Deep Learning. I am particularly excited about designing future visual implants for people with visual disabilities using Artificial Intelligence (AI) and Virtual Reality.

## EDUCATIONAL BACKGROUND

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### Postdoctoral Scholar in Computer Science

Feb 2022 - present

Computer Science Dept.,  
University of California, Santa Barbara (UCSB) – California, United States  
Advisors: Michael Beyeler

### PhD studies in Computer Vision

Oct 2017 - Jan 2022

Computer Science and Systems Engineering Dept.,  
Universidad de Zaragoza – Spain  
Advisors: Dr. Jose Jesús Guerrero Campo and Dr. Rubén Martínez Cantín  
Thesis title: “Egocentric Computer Vision and Machine Learning for Simulated Prosthetic Vision”

### Teaching

May 2022

#### Computer Science - Psychological and Brain Sciences

Subject of PSY-221F: Computational Neuroscience  
University of California, Santa Barbara (UCSB) – California, United States

### Teaching

Sep 2020 - Dic 2020

#### Master of Engineering in Industrial Engineering

Subject of Visión y Robótica  
Universidad de Zaragoza – Spain

### Teaching

Feb 2019 - April 2019

#### Master of Engineering in Industrial Engineering

Subject of Representación gráfica del patrimonio  
Universidad de Zaragoza – Spain

### Summer School on Computer Vision (BMVA 2018)

July 2018

Norwich - UK

### Subject of Vision and Robotics

Sep 2017 - Jan 2018

Master of Engineering in Industrial Engineering

Universidad de Zaragoza – Spain  
Advisors: Dr. Jose Jesús Guerrero Campo and Dr. Gonzalo López Nicolás

**Master of Chemical Engineering** Sep 2015 - May 2017  
Universitat de València – Spain  
Master’s degree final project title: “Elimination of a representative VOC by total oxidation using catalysts”  
Advisor: Dr. Benjamín E. Solsona Espriu

**Bachelor of Chemical Engineering** Sep 2011 - May 2015  
Universitat de València – Spain  
Final degree project title: “Design of catalytic converters in exhaust pipes”  
Advisor: Dr. Benjamín E. Solsona Espriu

## SCHOLARSHIPS

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**FPI scholarship (PhD candidate)** Oct 2017  
Research staff training program from the Ministry of Economy and Competitiveness for I+D+i  
Universidad de Zaragoza – Spain  
Research Project: “DPI2015-65962-R”

## WORK/RESEARCH EXPERIENCE

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**Visit PhD Researcher** May 2021 - June 2021  
Prof. Eduardo Fernández Jover  
*Retina model simulation through Virtual Reality*  
Instituto de Bioingeniería  
Universidad Miguel Hernández

**Visit PhD Researcher** Sep 2019 - Dec 2019  
Prof. Benoit Cottreau and Christophe Jouffrais  
*Spiking Neural Networks*  
IRIT and CerCo labs  
University of Toulouse

**Research Engineer** May 2017 - Oct 2017  
Robotics, Perception & Real Time Group  
Universidad de Zaragoza – Spain  
Research Project: “DPI2015-65962-R”  
*Research in Computer Vision and Robotics: Egocentric computer vision for the interaction with the environment of people with visual disability*

**Research Assistant** Sep 2016 - May 2017  
Engineering Department  
Universitat de València – Spain  
*Research in Carboquímica: Elimination of a representative VOC by total oxidation using catalysts*

## PUBLICATIONS

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JOURNALS, INTERNATIONAL CONFERENCES AND WORKSHOPS

- [1] “Efficient visual object representation using a biologically plausible spike-latency code and winner-take-all inhibition”  
**Melani Sánchez García** and Michael Beyeler  
Neuro Vision Workshop, Conference on Computer Vision and Pattern Recognition (CVPR)  
20, June 2022
- [2] “Visual acuity assessment with visual prosthesis through a virtual reality system”  
**Melani Sánchez García**, Roberto Moreollón Ruiz, Rubén Martínez Cantín, Jose J. Guerrero and Eduardo Fernandez Jover  
Submitted
- [3] “Augmented reality navigation system for visual prosthesis”  
**Melani Sánchez García**, Alejandro Perez Yus, Rubén Martínez Cantín and Jose J. Guerrero  
Submitted
- [4] “Influence of field of view in visual prostheses design: Analysis with a VR system”  
**Melani Sánchez García**, Rubén Martínez Cantín, Jesús Bermudez Cameo and Jose J. Guerrero  
Journal of Neural Engineering  
Published: October 7, 2020
- [5] “Semantic and Structural Image Segmentation for Prosthetic Vision”  
**Melani Sánchez García**, Rubén Martínez Cantín and Jose J. Guerrero  
PLOS ONE Journal  
Published: January 29, 2020
- [6] “Indoor Scenes Understanding for Visual Prosthesis with Fully Convolutional Networks”  
**Melani Sánchez García**, Rubén Martínez Cantín and Jose J. Guerrero  
VISAPP 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, 22, October 2018
- [7] “Structural and object detection for phosphene images”  
**Melani Sánchez García**, Rubén Martínez Cantín and Jose J. Guerrero  
Published in Arxiv, 25, September 2018
- [8] “Smart Representation of Indoor Scenes under Simulated Prosthetic Vision”  
**Melani Sánchez García**, Rubén Martínez Cantín and Jose J. Guerrero  
WiCV Women in Computer Vision Workshop, 15th European Conference on Computer Vision (ECCV), 9, September 2018

## **SUPERVISED BACHELOR/MASTER PRACTICUM SUPERVISOR**

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- Lorenzo Labadial Mur. Co-supervised with Rubén Martínez Cantín. Bs. Industrial Eng. Universidad de Zaragoza. 2020-2021
- Violeta Estepa Ramos. Co-supervised with Rubén Martínez Cantín. Bs. Industrial Eng. Universidad de Zaragoza. 2019-2020
- María Santos Villafranca: “Simulador de prótesis visual en entornos 360° con gafas de realidad virtual”. Co-supervised with Jose Jesús Guerrero Campo. Bs. Industrial Eng. Universidad de Zaragoza. 2018-2019
- Pedro Luis Compais Serrano: “Sistema de asistencia a la navegación basado en la cámara de eventos”. Co-supervised with Jose Jesús Guerrero Campo and Rubén Martínez Cantín. Bs. Industrial Eng. Universidad de Zaragoza. 2018-2019

## **PARTICIPATION IN RESEARCH REVISIONS**

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- [1] External Reviewer in Journal of Neural Engineering, 2022
- [2] External Reviewer in Journal of Neural Engineering, 2020
- [3] External Reviewer in ICRA IEEE International Conference on Robotics and Automation - 2020, Paris, Virtual Conference, IEEE Robotics and Automation Society.

## RESEARCH PROJECTS

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- Egocentric Computer Vision for Environment Interaction of Visually Impaired People (EVEIVI), DPI2015-65962-R. Financed by MINECO and UE/FEDER. P.I.(principal investigator): Jose J. Guerrero

## OTHER ACTIVITIES

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- “Influence of Field of View in Visual Prostheses Design: Analysis with a VR System”  
Presented at IX Jornada de Jóvenes Investigadores del I3A, 2020
- I was featured in *Ágora*, which is the Aragón Radio program dedicated to popular science.
- I participated in the initiative 'Una ingeniera en cada cole' (AMIT)
- “Semantic and Structural Image Segmentation for Prosthetic Vision”  
Presented at VIII Jornada de Jóvenes Investigadores del I3A, 2019

## PROGRAMMING LANGUAGES

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Python  
Tensorflow and Keras  
C/C++  
Matlab  
OpenCV  
R  
ROS  
Visual studio  
Gazebo

## LANGUAGES

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English — Fluent (C1)  
German — Beginner  
Spanish — Native

## REFERENCE LIST

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- **Josechu Guerrero** (jguerrer@unizar.es)  
Universidad de Zaragoza  
Robotics, Perception and Real-Time Group, I3A  
Zaragoza, Spain
- **Rubén Martínez Cantín** (rmcantin@unizar.es)  
Universidad de Zaragoza  
Robotics, Perception and Real-Time Group, I3A  
Zaragoza, Spain
- **Benoit Cottureau** (benoit.cottureau@cnrs.fr)  
CNRS  
Centre de Recherche Cerveau & Cognition  
Toulouse, France

- **Tushar Chauhan** (tushar.chauhan@cirs.fr )

CNRS

Centre de Recherche Cerveau & Cognition

Toulouse, France

- **Eduardo Fernández Jover** (e.fernandez@umh.es )

Instituto de Bioingeniería

Universidad Miguel Hernández

Elche, Spain