Mikel Val Calvo, Ph.D.

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About me

2023   ▐ **As a Postdoctoral Researcher**, my focus lies on data processing and the use of machine learning and deep learning techniques to deliver high-impact solutions. During the last year, I have participated in a project for the University of Murcia funded by BASF, in which I have developed database integration systems in graphs using language models such as ChatGPT and OpenAI libraries. This experience has further strengthened my expertise in implementing and experimenting with various approaches to introduce AI/ML solutions. I am well-versed in cutting-edge technologies such as object-oriented programming, PyTorch, image processing, real-time sensor signal processing, and machine learning. My work has been published in peer-reviewed scientific journals, showcasing my proficiency in visual neuroprosthesis development and human-robot interaction through multimodal emotion recognition using physiological signals. With a unique blend of software engineering knowledge for machine learning projects and science-oriented technical skills, I bring a valuable perspective to any team.

Research Experience

2023 – Present   ▐ **Postdoctoral Researcher,** Universidad de Murcia. In my current role, I am responsible for developing systems based on Large Language Models (LLMs) using libraries such as OpenAI and LangChain. I am actively engaged in a primary project focused on creating a semi-automatic system that translates structured databases into knowledge graphs, aimed at enhancing data interoperability and utilization. This work enables me to leverage my expertise in machine learning and deep learning to devise innovative solutions that improve data accessibility and utility. Additionally, I assume project management responsibilities and collaborate with cross-functional teams to ensure the successful implementation and deployment of AI/ML solutions.

2020 – 2022   ▐ **Postdoctoral Researcher,** Neuroprosthesis and Visual Rehabilitation Unit of the Bioengineering Institute, University Miguel Hernández of Elche. As a postdoctoral researcher, I led a team in the development and validation of a cortical visual neuroprosthetic device. My responsibilities encompassed scheduling and designing experimentation protocols, developing customized software for executing these protocols, and creating a wearable system prototype for image processing and electrical stimulation coding via brain-attached electrodes. Proficient in machine and deep learning projects employing computer vision for neuroprosthetic devices, I excel in team leadership, custom software development, and prototype creation for complex undertakings.

Research Experience (continued)

2017 – 2020　**PhD student,** Department of Electronics, Computer Technology and Projects, Univ. Politécnica de Cartagena, Cartagena, Spain. My PhD project focused on developing a machine learning system for emotional human-robot interaction. Specifically, I designed and implemented a system that utilized computer vision and an ensemble of deep learning models for facial expression recognition, as well as machine learning models for emotion estimation through physiological signal analysis. Employing a multimodal emotion estimation pipeline approach, the system enabled accurate emotional state estimation of humans interacting with the robot. I effectively presented my findings at multiple international conferences, highlighting my expertise in machine learning, computer vision, and emotional analysis.

2016 – 2017　**Assistant researcher.** Department of Electronics, Computer Technology and Projects, Univ. Politécnica de Cartagena, Cartagena, Spain. As a research assistant, I contributed to a project focused on controlling the behavior of a robot using a biological neuroprocessor. The neuroprocessor consisted of a culture of neurons connected to an amplifier, which, in turn, was connected to the robot. The robot employed a computer vision algorithm for center of mass detection, enabling obstacle-free navigation. The neural culture received inputs and generated outputs based on its current state, which the robot decoded as actions to be taken. This project provided valuable experience in neuroprocessing, robotics, and computer vision.

2015 – 2016　**Analyst programmer.** Neuroprosthesis and Visual Rehabilitation Unit of the Bioengineering Institute, University Miguel Hernández of Elche. I programmed an algorithm for center of mass detection using computer vision techniques. This algorithm facilitated obstacle-free navigation for the robot. The project was implemented using the Robot Operating System (ROS) development platform, which enhanced my proficiency in programming algorithms for robotic navigation and deepened my understanding of ROS. Additionally, I gained significant experience in computer vision through the implementation of the algorithm. Overall, this project helped me develop a strong understanding of computer vision and its applications in robotics.

Education

2017 – 2020　**Ph.D., UNED-UPCT-UMH**
Thesis title: *EMOTIONAL HUMAN-ROBOT INTERACTION USING PHYSIOLOGICAL SIGNALS.*

2016 – 2017　**M.Sc. Advanced A.I. of the UNED**

2010 – 2015　**B.Sc. Software engineering of the UNED**

Skills

Languages　Fluent in English, Spanish, and Basque (reading, writing, and speaking). Conversational abilities in Valencian.

Teamwork　Demonstrate strong interpersonal skills that facilitate effective collaboration and problem-solving within diverse teams. Experienced in decision-making, organization, critical thinking, and efficient time management, enabling successful handling of unexpected situations.

Skills (continued)

Data Processing ▌ Exhibit exceptional proficiency in various domains, including machine learning, deep learning, object-oriented programming, data analysis, and data visualization. Skilled in developing and implementing advanced machine learning algorithms and deep learning models, with a focus on Python programming.

Programming ▌ Proficient in PyTorch, Scikit-Learn, Pandas, Scipy, and Numpy. Currently expanding my knowledge to include the deployment of Large Language Model (LLM)-based systems.

Supplementary Education

Certification

2023 ▌ **ChatGPT Prompt Engineering for Developers**. Awarded by deeplearning.ai at Coursera.

2018 ▌ **Certified Neural Networks and Deep Learning**. Awarded by deeplearning.ai at Coursera.

▌ **Certified Convolutional neural networks**. Awarded by deeplearning.ai at Coursera.

▌ **Certified Improving deep neural networks: Hyperparameter tuning, Regularization and Optimization**. Awarded by deeplearning.ai at Coursera.

▌ **Certified Structuring Machine Learning Projects**. Awarded by deeplearning.ai at Coursera.

▌ **Certified Sequence Models**. Awarded by deeplearning.ai at Coursera.

References

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