ALEX ARMENGOL URPI

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EDUCATION

Massachusetts Institute of Technology Cambridge, MA
PhD in Human-Computer Interfaces 2018 – June 2023
- "La Caixa" Fellowship for studies at MIT (full tuition and stipend)

Massachusetts Institute of Technology Cambridge, MA
M.S., Mechanical Engineering. 2016 - 2018
- Concentration on Human-Computer Interfaces for IoT and AR/VR

CFIS - Universitat Politècnica de Catalunya Barcelona, Spain
Dual Major Bachelor's Degree: 2011 - 2016
- Telecommunications Engineering.
- Industrial Engineering.
- Visiting Student in the Department of Mechanical Engineering at MIT. Auto-ID Lab. Final degree thesis.
- CFIS scholarship fellow to pursue 2 major engineering degrees simultaneously. 40 admitted students/year in Spain.

RESEARCH EXPERIENCE

MIT, Department of Mechanical Engineering Cambridge, MA
Research Scientist October 2025 - Present
- Research on 3D grounding of unseen objects for spatial understanding in AR systems.

MIT, Department of Mechanical Engineering Cambridge, MA
Postdoctoral associate June 2023 – October 2025
- Research on AI-augmented AR to create custom training material for maintenance work trainees.
- Development of human and tool sensing frameworks to extract and quantify expertise and accelerate knowledge transfer and learning in crafts and sports.

MIT, Department of Mechanical Engineering Cambridge, MA
Research Assistant. Field Intelligence Lab. Advisor: Sanjay E. Sarma 2015 – June 2023
- Study of human implicit learning and tacit knowledge to enhance human expertise and AI performance
- Development of novel interfaces for foveal (overt) and peripheral (covert) visual attention tracking using EEG
- Brain-Computer Interfaces for Virtual Reality and the Internet of Things.
- Development of a thermal comfort sensing scheme using wearables for physiological signal monitoring.
- Research in RFID tag antenna-based sensing and in anti-counterfeiting architectures for the IoT.

UPC BARCELONATECH, Department of Electronics Engineering Barcelona, Spain
Research Assistant. EPIC Lab. Advisor: Eduard Alarcón Cot 2014 - 2015
- Research in Wireless Power Transfer. Development of a RIC-WPT system for wireless powering of spaces.

POMPEU FABRA UNIVERSITY, Information and Communication Department Barcelona, Spain
Research Assistant. Ubiquitous Computing Applications Lab. Advisor: Rafael Pous Andrés 2010 - 2011
- Automated non-invasive system for grape ripening estimation using a wireless sensor network.

INDUSTRY EXPERIENCE

LIFEVERSE AI London, UK
Part time consultor Spring 2023
- Consulting on research directions on AI for behavioral understanding on children's attention for education

PHILIPS NORTH AMERICA Cambridge, MA
Augmented Reality Research Intern. Summer 2019
- Research on Augmented Reality-guided surgical procedures.

ALMATECH INC. Barcelona, Spain
Co-leader of engineering department. Oct 2014 – March 2015
- Worked on UPC-derived spinoff company devoted to the WPT domain.

KEONN TECHNOLOGIES — Barcelona, Spain
Intern. System integration. — Summer 2014
- Involved in an RFID interactive retail system project.

CM4 ENGINYERIA S.A. — Barcelona, Spain
Intern. Mechanical engineering department. — Summer 2013
- Involved in several projects related to all industrial sectors, working from concept to production.

SELECTED PUBLICATIONS

[1] *HoLocate: An Open-Vocabulary, Zero-Shot 3D Grounding Framework for Augmented Reality*
Alex Armengol-Urpi, Dulanga Weerakoon, Andres Salazar, Sanjay Sarma
In preparation. December 2025.

[2] *Free Form 3D Overlays for Open-ended Augmented Reality Task Assistance Using LLMs*
Alex Armengol-Urpi, Dulanga Weerakoon, Andres Salazar, Sanjay Sarma
In preparation. December 2025.

[3] *Cognitive Reinforcement: Capturing Tacit Knowledge and Enhancing Expertise with a BCI for Visual Attention Monitoring*
Alex Armengol-Urpi, Andres Salazar, Pawan Sinha, Sanjay Sarma
Journal of Neural Engineering (under review). August 2025.

[4] *Brain-Hack: Remotely Injecting False Brain-Waves with RF to Take Control of a Brain-Computer Interface*
Alex Armengol-Urpi, Reid Kovacs, Sanjay Sarma
Workshop on CPS&IoT Security and Privacy. **Best paper award.**

[5] *Brainwave-Augmented Eye Tracker: High-Frequency SSVEPs Improves Camera-Based Eye Tracking Accuracy*
Alex Armengol-Urpi, Andres Salazar, Sanjay Sarma
IUI 2022.

[6] *A system approach for closed-loop assessment of neuro-visual function based on convolutional neural network analysis of EEG signals*
Simon Stock, **Alex Armengol-Urpi**, Bálint Kovács, Heiko Maier, Marius Gerdes, Wilhelm Stork, Sanjay Sarma
SPIE Neurophotonics 2022

[7] *Towards Industrial IoT-AR Systems Using Deep Learning-Based Object Pose Estimation*
Yongbin Sun, Sai Nithin Reddy Kantareddy, Joshua Siegel, **Alex Armengol-Urpi**, Xiaoyu Wu, Hongyu Wang, Sanjay Sarma
IPCCC 2019

[8] *Magichand: Interact with IoT Devices in Augmented Reality Environment*
Yongbin Sun, **Alex Armengol-Urpi**, Sai Nithin Reddy Kantareddy, Joshua Siegel, Sanjay Sarma
IEEE VR 2019

[9] *Sublime: a Hands-Free Virtual Reality Menu Navigation System Using a High-Frequency SSVEP-based Brain-Computer Interface*
Alex Armengol-Urpi, Sanjay Sarma
VRST 2018

Patents
[10] Sanjay E Sarma, Rahul Bhattacharyya, Joshua E Siegel, **Alex Armengol-Urpi**, Pankhuri Sen, Sai Nithin Reddy Kantareddy. "Antenna and system for wireless sensing of health monitoring"

[11] Sanjay E Sarma, **Alex Armengol-Urpi**. "Brain-computer interface for user's visual focus detection"

FELLOWSHIPS, AWARDS & HONORS

- **Best paper award.** Workshop on CPS&IoT Security and Privacy, 2023.
- **"La Caixa" Fellowship.** Full funding for 2 years of PhD program at MIT, 2018.
- **CFIS Fellow.** Telecom. Engineering Degree tuition covered by the Technical University of Catalonia, 2011.
- **Youth Research Awards.** Award given by the Government of Catalonia for my high school final thesis, 2010.
- **Gov. of Catalonia Fellow.** 1st year college tuition covered by Gov. of Catalonia for Honors in high school, 2010.
- **Catalunya Caixa Bank Fellow.** For outstanding score in the National University entry exam (13.48/14), 2010.