CECILIA A. CALLEJAS PASTOR

PhD. in Biomedical Engineering

EDUCATION

Chungnam National University
09.2021 – 08.2024
Daejeon, South Korea

PhD Degree - Biomedical Engineering

Overall GPA 99.2 - Full Scholarship Recipient
Thesis title: A Novel Framework for Automated Vestibular Disorder Diagnosis: Artificial Intelligence Models and a Mobile Health Screening Tool

Chungnam National University
09.2019 – 08.2021
Daejeon, South Korea

MSc Degree - Biomedical Engineering

Overall GPA 97.8 - Full Scholarship Recipient
Thesis title: Two-dimensional Image-based Screening Tool for Infants with Positional Cranial Deformities: A Machine Learning Approach

Bolivian Catholic University
02.2016 – 08.2016
La Paz, Bolivia

Professor Training for Higher Education

Diploma in Professor Training for Higher Education

Bolivian Catholic University
02.2012 – 06.2016
La Paz, Bolivia

BSc Degree - Biomedical Engineering

Overall GPA 88.5
Scholarship awarded for highest GPA in multiple semesters
Thesis title: Design of a Prototype Pneumatic Arm for People with Muscular Atrophy or Upper Limb Paralysis

Don Bosco School
02.2008 – 10.2011
La Paz, Bolivia

Technical Certificate in Health Sciences

High School Diploma in Humanities with emphasis on Science and Health

EXPERIENCE

Seoul National University Hospital & Chungnam National University
09.2024 – Current
Daejeon, South Korea

Postdoctoral Researcher

Leading research and development of AI-driven medical technologies, focusing on algorithm design, signal processing, and machine learning for clinical applications. Proficient in Python, MATLAB, Java, and Flutter for cross-platform medical software development. Combining expertise in computer vision and predictive modeling with hardware integration through embedded systems. Specializing in biomedical signal processing and developing practical AI-based tools.

INFORMATION

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0000-0002-5033-4573
Bolivian
Galma-dong 762, Seo-gu,
Daejeon City, South Korea

LANGUAGES

Spanish
English [TOEIC 970]
Korean [TOPIK 5]
Italian

H&S SKILLS

Hardware Design and Modeling
- SolidWorks
- OrCAD
- PADS

Firmware Development
- Segger Embedded Studio
- STM32 CubeMX

Software Development
- Python
- MATLAB
- Android Studio / Java
- Flutter / Dart
- Jira Cloud
- REST API and Postman

SOFT SKILLS

Hard-working | Attention to detail | Eye for detail | Motivator & Leader | Critical thinking | Responsibility | Collaboration

MedInTech Inc.

07.2024 – 08.2024
Seoul, South Korea

Senior Researcher Intern

Developed a web server for monitoring in-house GPU status, designed and implemented the MedInTech Gateway software for endoscopic video capture, and engineered the MD-SC-300, an AI-powered cancer classification system for endoscopic devices. Demonstrated strong technical capabilities and made significant contributions to the company's R&D initiatives.

Chungnam National University

08.2019 – 08.2024
Daejeon, South Korea

Researcher

Designed, developed, tested, and debugged hardware and software for medical devices, including firmware implementation and application development with database integration. Utilized Python, Java, and MATLAB across various development environments. Employed OrCad, PADs, and SolidWorks for hardware design, and developed firmware using Segger Embedded Studio and CubeMX. Applied AI techniques for medical data processing and analysis.

Daewoong Foundation

02.2022 – 06.2024
Seoul, South Korea

AI & Big Data developer scholar

Developed comprehensive pharmaceutical intelligence solutions, including a multilingual medical document translation platform Korean-English powered by LLM models and data-driven trend analysis systems. Created web-based applications with REST API integration and intuitive Streamlit interfaces. Implemented automated article crawling systems to track industry developments and monitor drug pipeline data, enhancing pharmaceutical market intelligence capabilities.

IDETECA S.R.L.

09.2017 – 06.2018
La Paz, Bolivia

Head of Biomedicine and Chemical Department

Evaluated, tested, and troubleshot software and hardware components for biomedical and electronic devices, working with various sensor technologies and measurement instruments.

Bolivian Catholic University

03.2018 – 08.2018
La Paz, Bolivia

Professor

Served as part-time professor teaching Electromagnetism and Calculus 1 courses.

IMEXCOMED S.R.L.

05.2016 – 07.2017
La Paz, Bolivia

Technical Service Department Engineer

Performed preventive and corrective maintenance of medical equipment, primarily endoscopic and surgical devices. Provided expert installation services and advanced software support in hospital environments.

HP Medical

05.2015 – 07.2015
La Paz, Bolivia

Internship as Electromedicine Technician

Conducted equipment demonstrations and operational training for various medical devices designed for both home and hospital use. Managed equipment reception, diagnosis, and repair processes.

ACHIEVEMENTS

Best Poster Award (2024)

Award for the best poster presentation by The Korean Innovative Medical Technology Society, South Korea.

Best Oration Award (2023)

Award for the best oral presentation by The Korean Balance Society, South Korea.

Research incentive scholarship (2022)

Research allowance incentive for the development of a three-month project by Chungnam National University, South Korea.

Global Korean Scholarship Program Scholar (2021 - 2024)

Full scholarship and allowance for Doctorate degree given by National Institute for International Education (NIIED), South Korea.

Research incentive scholarship (2021)

Research allowance incentive for the development of a three-month project by Chungnam National University, South Korea.

Best Poster Award (2021)

Given by the International Biomedical Engineering Conference, South Korea.

AI & BigData Hackathon (2021)

Third Place on AI & BigData competence with "Olppaemi: an assessment and monitoring tool for skin analysis using AI algorithm" organized by Daewoong Foundation, South Korea.

Best Research Award (2021)

Given by Chungnam National University, South Korea

Global Scholarship Program Scholar (2021)

Reasearch incentive granted based on merit by Daewoong Foundation, South Korea.

Global Korean Scholarship Program Scholar (2018 - 2021)

Full scholarship and allowance for Master's degree given by National Institute for International Education (NIIED), South Korea.

PUBLICATIONS

Journal Articles

- **CA Callejas Pastor**, Ryu, H., Joo, J., Ku, Y., & Suh, M. (Under Review). Clinical decision support for vestibular diagnosis: Large-scale machine learning with lived experience coaching. *NPJ journal*.
- Ryu, H., **CA Callejas Pastor**, Joo, J., Ku, Y., & Suh, M. (Under Review). An advanced rule-based mobile classifier for the automated diagnosis of vestibular disorders. *International Journal of Audiology*. (First Co-Author).
- **CA Callejas Pastor**, Oh, C., Hong, B., & Ku, Y. (2024). Machine learning-based cardiac index estimation using photoplethysmography in off-pump coronary artery bypass surgery. *Journal of Clinical Medicine*, *13*, 7145. doi:10.3390/jcm13237145
- **CA Callejas Pastor**, Kwon, C., Joo, J., Kim, H., Ku, Y., & Suh, M. (2023). Feasibility of an inertial measurement unit sensor-based guiding system for the treatment of benign paroxysmal positional vertigo. *Scientific Reports*, *13*, 3169. doi:10.1038/s41598-023-29685-8
- **CA Callejas Pastor**, Jung, I., Seo, S., Kwon, S., Ku, Y., & Choi, J. (2020). Two-dimensional image-based screening tool for infants with positional cranial deformities: A machine learning approach. *Diagnostics*, *10*, 495. doi:10.3390/diagnostics10070495

Conferences

- Karim, I., Kwon, C., **CA Callejas Pastor**, & Ku, Y. (2024). Design of a non-invasive bimodal auditory nerve stimulation circuit for tinnitus treatment. In *International Biomedical Engineering Conference 2024 (IBEC)*, Seoul, South Korea.
- Kwon, C., Kim, E., Kim, S., **CA Callejas Pastor**, Joo, J., Suh, M., & Ku, Y. (2024). A study on feasibility of benign paroxysmal positional vertigo treatment assistive devices and quantitative analysis of the treatment risk factor. In *International Biomedical Engineering Conference 2024 (IBEC)*, Wonju, South Korea.
- **CA Callejas Pastor**, Joo, J., Ryu, H., Suh, M., & Ku, Y. (2023). Development of a screening app for vestibular disorders: A promising tool for diagnosis. In *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2023)*, Sydney, Australia.
- **CA Callejas Pastor**, Ryu, H., Joo, J., Suh, M., & Ku, Y. (2023). A rule-based mobile application for the screening of vestibular disorders: A pilot study. In *Korean Equilibrium Society Conference 2023*, Seoul, South Korea.
- **CA Callejas Pastor**, Oh, C., Hong, B., & Ku, Y. (2022). PPG wave analysis-based cardiac output estimation in off-pump coronary artery bypass surgery. In *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2022)*, Glasgow, United Kingdom.
- **CA Callejas Pastor**, Suh, M., & Ku, Y. (2022). Machine learning-based automated classification of vestibular disorders. In *International Biomedical Engineering Symposium 2022 (IBES)*, Incheon, South Korea.
- **CA Callejas Pastor**, Ku, Y., Kwon, C., & Suh, M. (2021). An electronystagmogram based nystagmus detection algorithm: A machine learning approach. In *2021 International Conference on Electronics, Information, and Communication (ICEIC)*, Jeju, South Korea.
- **CA Callejas Pastor**, Oh, C., Hong, B., & Ku, Y. (2021). Machine learning-based cardiac output estimation using non-invasive photoplethysmogram in off-pump coronary artery bypass surgery. In *International Biomedical Engineering Conference 2021 (IBEC)*, Seoul, South Korea.

Patents

- S Byun, M Suh, HT Ryu, JS Joo, Y Ku, **CA Callejas Pastor**, & S Oh. (2023). *System and method for dizziness etiology diagnosis*. KR10-2023-0055247. South Korea.
- J Choi, Y Ku, & **CA Callejas Pastor**. (2020). *Inclination measuring device, measuring method and computer program using marker*. KR2377363. South Korea.
- J Choi, Y Ku, IY Jung, & **CA Callejas Pastor**. (2020). *Inclination measuring device, measuring method and computer program to measure the degree of tilt or rotation of the user's head through human body image*. KR2377364. South Korea.