Catalina Gómez Caballero

cgomezc1@jhu.edu - [Google Scholar](#) - [Website](#)

Research Interests

Artificial Intelligence, Computer Vision, Human-AI interaction, Machine Learning, Medical Imaging.

Education

PhD Student in Computer Science Fall 2020 - present
Johns Hopkins University, advisor: Mathias Unberath

M.Sc. in Biomedical Engineering, *cum laude* March 2019
Universidad de los Andes

- Thesis: Automatic Seizure Detection based on imaged-EEG signals through statistical learning. Directed by Mario Valderrama and Pablo Arbeláez

B.S. in Biomedical Engineering, *summa cum laude* October 2017
Universidad de los Andes

- Thesis: Development of a device for electric stimulation to reduce the degree of atrophy in patients with immobilized limbs. Directed by: Juan Carlos Cruz and Mario Valderrama

Achievements

- Instructional Enhancement Grant, Johns Hopkins University, 2022
- Intuitive Surgical Best Project Award in the Deep Learning course CS.682 at Johns Hopkins University, December 2020
- Fulbright Colciencias Scholarship 2019, August 2019
- Project funding by the Vice-Chancellor of Research at Universidad de los Andes, January 2018-December 2019
- Award of Semester Excellence at the Universidad de los Andes for the best GPA of the Department of Biomedical Engineering in 2014

Experience

Johns Hopkins University
Teaching Assistant 01/2022-12/2022

- Supervised projects and met with students during office hours for the course Machine Learning: Deep Learning (EN.601.482/682)
- Graded, delivered lectures, and met with students during office hours for the course Machine Learning: Interpretable Machine Learning Design (EN.601.484/684)

Universidad de los Andes
Graduate Research Assistant 08/2017-08/2020

- Developed a benchmark to study astronomical transient object detection with deep learning techniques from image sequences

- Applied Deep Learning techniques to identify mineral components in thin sections from databases collected by the Colombian Geological Service

Undergraduate Teaching Assistant 01/2015-05/2017
- Supported freshmen in Biomedical Engineering with first level courses (calculus, physics, chemistry) and advise them in academical decisions

Max Planck Institute for Astrophysics
Summer Intern 07-08/2018
- Contributed to the characterization of data from the IllustrisTNG porject to analyze Local Group analogues

Presentations

NeurIPS 2021 Human Centered AI workshop - Oral presentation: Knowledge Imbalance in AI-Assisted Decision-Making: Collaborating with Non-experts
Virtual conference, 2021
SIPAIM 2019 - Oral presentation: Learning to Segment Brain Tumors
Instituto Tecnológico Metropolitano de Medellín, Medellín, Colombia 2019
ICTALS 2019 - Poster presentation Automatic Seizure Detection in Scalp and Intracranial Recordings through Convolutional Neural Networks
International Conference for Technology and Analysis of Seizures, Exeter, England, 2019
Neuroscience 2018 - Poster presentation: Seizure Detection based on "imaged-EEG" signals through statistical learning
Society for Neuroscience, San Diego, 2018
SIPAIM 2017 - Oral presentation: Recognition of skin melanoma through dermoscopic image analysis
Universidad Nacional de Colombia, San Andrés, Colombia 2017

Publications

Peer-reviewed Journal Articles

- **Gomez, C.**, Unberath, M., Huang, C. M. (2023). Mitigating knowledge imbalance in AI-advised decision-making through collaborative user involvement. International Journal of Human-Computer Studies, 172, 102977.

- Liu, T. A., Chen, H., **Gomez, C.**, Correa, Z. M., Unberath, M. (2023). Direct Gene Expression Profile Prediction for Uveal Melanoma from Digital Cytopathology Images via Deep Learning and Salient Image Region Identification. Ophthalmology Science, 3(1), 100240.

- Chen, H.*, **Gomez, C.***, Huang, C. M., Unberath, M. (2022). Explainable medical imaging AI needs human-centered design: guidelines and evidence from a systematic review. npj Digital Medicine, 5(1), 156.
  * Joint first authors.

- Escobar, M., Jeanneret, G., Bravo-Sánchez, L., Castillo, A., **Gómez, C.**, Valderrama, D., ... Arbelaez, P. (2022). Smart pooling: AI-powered COVID-19 informative group testing. Scientific reports, 12(1), 1-12.

- **Gómez, C.**, Neira, M., Hernández Hoyos, M., Arbeláez, P., Forero-Romero, J. E. (2020). Classifying image sequences of astronomical transients with deep neural networks. Monthly Notices of the Royal Astronomical Society, 499(3), 3130-3138.

- Neira, M., **Gómez, C.**, Suárez-Pérez, J. F., Gómez, D. A., Reyes, J. P., Hoyos, M. H., ... Forero-Romero, J. E. (2020). MANTRA: A Machine-learning Reference Light-curve Data Set for Astronomical Transient Event Recognition. The Astrophysical Journal Supplement Series, 250(1), 11.

- **Gómez, C.**, Arbeláez, P., Navarrete, M., Alvarado-Rojas, C., Le Van Quyen, M., Valderrama, M. (2020). Automatic seizure detection based on imaged-EEG signals through fully convolutional networks. Scientific reports, 10(1), 1-13.

Peer-reviewed Conference Papers

- Chen, H., Liu, T.Y.A., **Gomez, C.**, Correa, Z., Unberath, M. "An Interpretable Algorithm for Uveal Melanoma Subtyping from Whole Slide Cytology Images", ICML Workshop on Interpretable Machine Learning in Healthcare, 2021.

- Daza, L., **Gómez, C.**, Arbeláez, P. (2020). Cerberus: A multi-headed network for brain tumor segmentation. In International MICCAI Brainlesion Workshop (pp. 342-351). Springer, Cham.

- Daza, L., **Gómez, C.**, Arbeláez, P. (2020). Learning to segment brain tumors. In 15th International Symposium on Medical Information Processing and Analysis (Vol. 11330, p. 113300G). International Society for Optics and Photonics.

- **Gómez, C.**, Herrera, D. S. (2017). Recognition of skin melanoma through dermoscopic image analysis. In 13th International Conference on Medical Information Processing and Analysis (Vol. 10572, p. 1057211). International Society for Optics and Photonics.

Skills

Programming Languages	Python, R, MATLAB
Tools	PyTorch, JMP, Git, React, MeshLab, LaTeX
Relevant Coursework	Computer Vision, Machine Learning: Deep Learning, Introduction to HCI, Machine Learning for Trustworthy AI, Introduction to Algorithms
Languages	Spanish (native) English (proficient) French (beginner)
Community Service	Computer Science Graduate Student Council, 10/2022 - present Fundación con las Manos Bogotá, 02/2018 - 07/2020