Augusto Garcia Agundez Garcia

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UCSF Division of Medicine
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Fields of Interest

- Clinical Natural Language Processing (NLP)
- Clinical Artificial Intelligence (AI) & Machine Learning (ML)
- Biosignal Processing
- Information Retrieval

Education

TU Darmstadt 07/2015 – 09/2020
Ph.D. (Electronic Engineering & Computer Science) *Darmstadt, Germany*

Technical University of Madrid (UPM) 09/2007 – 02/2015
M.Sc. (Electronic Engineering) *Madrid, Spain*

CEPADE Business School (UPM) 09/2009 – 06/2012
Expert in Foreign Trade *Madrid, Spain*

Experience

University of California San Francisco 07/2023 – Present
Postdoc. PI: Jinoos Yazdany & Gabriela Schmajuk. Topics: NLP / AI in Rheumatology *San Francisco, CA, USA*

Brown University 02/2021 – 07/2023
Postdoc. PI: Carsten Eickhoff. Topics: Clinical NLP / AI *Providence, RI, USA*

TU Darmstadt 10/2020 – 07/2023
Associated Researcher. PI: Stefan Göbel. Topics: ML, Biosignal Processing *Darmstadt, Germany*

TU Darmstadt 07/2015 – 09/2020
Ph.D. Candidate. PI: Ralf Steinmetz. Topics: Serious Games, ML, Biosignal Processing *Darmstadt, Germany*

TU Darmstadt 09/2014 – 04/2015
Research Assistant. PI: Stefan Göbel. Topics: Serious Games, ML, Biosignal Processing *Darmstadt, Germany*

Grants

European Commission Marie-Skłodowska Curie Postdoctoral Fellowship 03/2022 – 07/2023
Machine Learning Based Prediction of Stroke (MAESTRO). ***Role: PI*** *Funding: 245,732.16€*

Peter G. Peterson Foundation, USA 07/2022 – 06/2023
Explaining COVID-19 Outcome Disparities via Natural Language Processing. ***Role: PI*** *Funding: $100,000*

Instituto de Salud Carlos III, Ministerio de Sanidad, Spain 01/2022 – 12/2024
Clinical Decision Support for NSAID Hypersensitivity. ***Role: Co-I*** *PI: Prof. Elena Garcia-Martin*

Ministry for Education and Research (BMBF), Germany 03/2017 – 03/2020
PDExergames: Exergames for Parkinson's Disease. ***Role: Ph.D. Student*** *PI: Prof. Elke Kalbe & Dr. Stefan Göbel*

Klaus-Tschira Stiftung, Germany 09/2016 – 02/2019
Augmented Reality Back Trainer. ***Role: Ph.D. Student*** *PI: Prof. Frank Hänsel & Dr. Stefan Göbel*

TU Darmstadt, Germany 09/2017 – 07/2018
Urban Health Games. ***Role: Ph.D. Student*** *PI: Prof. Martin Knöll*

European Commission 7th Framework Program 01/2016 – 10/2016
Alfred: Interactive Assistant for Independent Living and Active Aging. ***Role: Ph.D. Student*** *PI: Dr. Stefan Göbel*

LOEWE Hessen, Germany 08/2015 – 02/2016
VR Diagnostics System. ***Role: Ph.D. Student*** *PI: Dr. Stefan Göbel*

Teaching

AI Lab Undergraduate Research Mentorship 2021 – 2023
Brown University

Serious Games Seminar 2015-2020
TU Darmstadt

Serious Games 2016-2020
TU Darmstadt

Serious Games Lab Course 2015-2019
TU Darmstadt

Industrial Colloquium: Medical Technology in Electrical Engineering 2017
TU Darmstadt

Advising

M.Sc. (7):
Nandita Gopal (2016), Sanjeev Srestha (2016), Saroj Sharma (2016), Eduard Dobermann (2017), Cem Piroglu (2023), Marc Seelemann (2024), Simon Frank (2024)
B.Sc. (9):
Aiko Westmeier (2016), Benedikt Boehning (2017), Tobias Ochs (2017), Manuel Stork (2019), Tanja Rohlfing (2019), Robert Kanzler (2019), Martin Konrad (2020), Faith Shim (2023), Kavon Arbabi (2024, Brown UTRA undergraduate research award)

Service

Review Editor
Frontiers in Medicine
Frontiers in Pharmacology

Program Commitee
AMIA Annual Symposium, 2024
Affective Computing + Intelligent Interaction, 2024
Joint Conference on Serious Games, 2018

Guest Editor
Frontiers in Medicine
Frontiers in Computer Science
Frontiers in Pharmacology
MDPI Sensors

Reviewer
AMIA Annual Symposium, 2023-Present
AMIA Informatics Summit, 2023-Present
ACL ICMI, 2022-present

Frontiers in Medicine
Journal of Personalized Medicine
BMJ Open
Disability and Rehabilitation
BMC Medical Education
European Journal of Neuroscience
Games for Health Journal
International Journal of Human-Computer Interaction
Journal of Ambient Intelligence and Humanized Computing
Journal of Imaging
Sports Engineering
The Cerebellum

Memberships
Association for Computational Linguistics (ACL) 2024
Association for Computing Machinery (ACM) 2023 – Present
American Medical Informatics Association (AMIA) 2022 – Present

Other

Languages
Spanish (fluent), English (fluent), German (fluent), French (intermediate), Italian (limited proficiency), Latin (limited proficiency)
Programming
Python, Pytorch, Tensorflow, Matlab, R, Java, SQL, Docker, Git, SLURM

Publications

[1] **Garcia-Agundez, Augusto**, J. L. Kay, J. Li, M. Gianfrancesco, B. Rai, A. Hu, G. Schmajuk, and J. Yazdany. Structuring medication signeturs as a language regression task: comparison of zero- and few-shot GPT with fine-tuned models. *JAMIA Open*, 7(2):ooae051, 06 2024, https://academic.oup.com/jamiaopen/article-pdf/7/2/ooae051/58273614/ooae051.pdf.

[2] B. Y. Miao, I. Y. Chen, C. Y. Williams, J. Davidson, **Garcia-Agundez, Augusto**, H. Sun, T. Zack, A. J. Butte, and M. Sushil. Updating the minimum information about clinical artificial intelligence (mi-claim) checklist for generative modeling research. *arXiv preprint arXiv:2403.02558*, 2024.

[3] **Garcia-Agundez, Augusto**, E. García-Martín, and C. Eickhoff. The potential of machine learning in pharmacogenetics, pharmacogenomics and pharmacoepidemiology-volume ii. *Frontiers in Pharmacology*, 14:1277561, 2023.

[4] N. Singh, C. Eickhoff, **Garcia-Agundez, Augusto**, P. Bertone, S. S. Paudel, D. T. Tambe, L. A. Litzky, K. Cox-Flaherty, J. R. Klinger, S. F. Monaghan, et al. Transcriptional profiles of pulmonary artery endothelial cells in pulmonary hypertension. *Scientific Reports*, 13(1):22534, 2023.

[5] I. Sears, **Garcia-Agundez, Augusto**, G. Zerveas, W. Rudman, L. Mercurio, C. E. Ventetuolo, A. Abbasi, and C. Eickhoff. Leveraging unlabeled electroencephalographic data to predict neurological recovery for comatose patients following cardiac arrest. In *2023 Computing in Cardiology (CinC)*, volume 50, pages 1–4. IEEE, 2023.

[6] C. Meyer, D. Adkins, K. Pal, R. Galici, **Garcia-Agundez, Augusto**, and C. Eickhoff. Neural text generation in regulatory medical writing. *Frontiers in Pharmacology*, 14:224, 2023.

[7] S. Eickhoff, **Garcia-Agundez, Augusto**, D. Haidar, B. Zaidat, M. Adjei-Mosi, P. Li, and C. Eickhoff. A feasibility study on ai-controlled closed-loop electrical stimulation implants. *Scientific Reports*, 13(1):10163, 2023.

[8] A. Ahmed, **Garcia-Agundez, Augusto***, I. Petrovic, F. Radaei, J. Fife, J. Zhou, H. Karas, S. Moody, J. Drake, R. N. Jones, et al. Delirium detection using wearable sensors and machine learning in patients with intracerebral hemorrhage. *Frontiers in Neurology*, 14:1135472, 2023.

[9] **Garcia-Agundez, Augusto**, E. García-Martín, and C. Eickhoff. The potential of machine learning in pharmacogenetics, pharmacogenomics and pharmacoepidemiology. *Frontiers in Pharmacology*, 13, 2022.

[10] **Garcia-Agundez, Augusto** and C. Eickhoff. When bert fails–the limits of ehr classification. *Presented at the 2022 AMIA Symposium. arXiv preprint arXiv:2208.10245*, 2022.

[11] **Garcia-Agundez, Augusto**, O. Ojo, H. A. Hernández-Roig, C. Baquero, D. Frey, C. Georgiou, M. Goessens, R. E. Lillo, R. Menezes, N. Nicolaou, et al. Estimating the covid-19 prevalence in spain with indirect reporting via open surveys. *Frontiers in Public Health*, 9:658544, 2021.

[12] **Garcia-Agundez, Augusto** and C. Eickhoff. Towards objective quantification of hand tremors and bradykinesia using contactless sensors: A systematic review. *Frontiers in Aging Neuroscience*, page 694, 2021.

[13] P. Caserman*, **Garcia-Agundez, Augusto***, A. Gámez Zerban, and S. Göbel. Cybersickness in current-generation virtual reality head-mounted displays: systematic review and outlook. *Virtual Reality*, 25(4):1153–1170, 2021.

[14] C. Baquero, P. Casari, A. Fernandez Anta, A. García-García, D. Frey, **Garcia-Agundez, Augusto**, C. Georgiou, B. Girault, A. Ortega, M. Goessens, et al. The coronasurveys system for covid-19 incidence data collection and processing. *Frontiers in Computer Science*, 3:641237, 2021.

[15] J. Álvarez, C. Baquero, E. Cabana, J. P. Champati, A. F. Anta, D. Frey, **Garcia-Agundez, Augusto**, C. Georgiou, M. Goessens, H. Hernández, et al. Estimating active cases of covid-19. *medRxiv*, 2021.

[16] O. Ojo, **Garcia-Agundez, Augusto**, B. Girault, H. Hernández, E. Cabana, A. García-García, P. Arabshahi, C. Baquero, P. Casari, E. J. Ferreira, et al. Coronasurveys: using surveys with indirect reporting to estimate the incidence and evolution of epidemics. *arXiv preprint arXiv:2005.12783*, 2020.

[17] C. Koch, **Garcia-Agundez, Augusto**, S. Göbel, and F. Hänsel. A case control study to investigate differences in motor control between individuals with and without non-specific low back pain during standing. *Plos one*, 15(7):e0234858, 2020.

[18] H. Becker, **Garcia-Agundez, Augusto**, P. N. Müller, T. Tregel, A. Miede, and S. Göbel. Predicting functional performance via classification of lower extremity strength in older adults with exergame-collected data. *Journal of NeuroEngineering and Rehabilitation*, 17(1):1–8, 2020.

[19] C. Baquero, P. Casari, A. F. Anta, D. Frey, **Garcia-Agundez, Augusto**, C. Georgiou, R. Menezes, N. Nicolaou, O. Ojo, and P. Patras. Measuring icebergs: Using different methods to estimate the number of covid-19 cases in portugal and spain. *Medrxiv*, 2020.

[20] **Garcia-Agundez, Augusto**, C. Reuter, P. Caserman, R. Konrad, and S. Göbel. Identifying cybersickness through heart rate variability alterations. *International Journal of Virtual Reality*, 19(1):1–10, 2019.

[21] **Garcia-Agundez, Augusto**, C. Reuter, H. Becker, R. Konrad, P. Caserman, A. Miede, and S. Göbel. Development of a classifier to determine factors causing cybersickness in virtual reality environments. *Games for health journal*, 8(6):439–444, 2019.

[22] **Garcia-Agundez, Augusto**, M. Goosses, R. Konrad, M. Stork, H. Becker, S. Göbel, and E. Kalbe. Pdpuzzletable: a leap motion exergame for dual-tasking rehabilitation in parkinson's disease. design and study protocol. In *Joint International Conference on Entertainment Computing and Serious Games*, pages 402–406. Springer, Cham, 2019.

[23] **Garcia-Agundez, Augusto**, A.-K. Folkerts, R. Konrad, P. Caserman, T. Tregel, M. Goosses, S. Göbel, and E. Kalbe. Recent advances in rehabilitation for parkinson's disease with exergames: A systematic review. *Journal of neuroengineering and rehabilitation*, 16(1):1–17, 2019.

[24] P. Caserman, **Garcia-Agundez, Augusto**, R. Konrad, S. Göbel, and R. Steinmetz. Real-time body tracking in virtual reality using a vive tracker. *Virtual Reality*, 23(2):155–168, 2019.

[25] P. Caserman, **Garcia-Agundez, Augusto**, and S. Göbel. A survey of full-body motion reconstruction in immersive virtual reality applications. *IEEE transactions on visualization and computer graphics*, 26(10):3089–3108, 2019.

[26] **Garcia-Agundez, Augusto**, E. Dobermann, and S. Göbel. Design of a bci controlled serious game for concentration training. In *Joint International Conference on Serious Games*, pages 169–174. Springer, Cham, 2018.

[27] **Garcia-Agundez, Augusto**, F. Baumgartl, F. Kendeffy, R. Konrad, H. Wunsch, and S. Göbel. Development of a wii balance board array system for exergames. In *Joint International Conference on Serious Games*, pages 235–240. Springer, Cham, 2018.

[28] F. Feldwieser, J. Kiselev, S. Hardy, **Garcia-Agundez, Augusto**, C. Eicher, E. Steinhagen-Thiessen, and S. Göbel. Evaluation of biofeedback based bridging exercises on older adults with low back pain: A randomized controlled trial. *Physiotherapy Practice and Research*, 39(1):15–25, 2018.

[29] **Garcia-Agundez, Augusto**, A. Westmeier, P. Caserman, R. Konrad, and S. Göbel. An evaluation of extrapolation and filtering techniques in head tracking for virtual environments to reduce cybersickness. In *Joint International Conference on Serious Games*, pages 203–211. Springer, Cham, 2017.

[30] **Garcia-Agundez, Augusto**, A.-K. Folkerts, R. Konrad, P. Caseman, S. Göbel, and E. Kalbe. Pddancecity: an exergame for patients with idiopathic parkinson's disease and cognitive impairment. *Mensch und Computer 2016–Workshopband*, 2017.

[31] **Garcia-Agundez, Augusto**, T. Dutz, and S. Goebel. Adapting smartphone-based photoplethysmograpy to suboptimal scenarios. *Physiological measurement*, 38(2):219, 2017.

[32] **Garcia-Agundez, Augusto**, S. Sharma, T. Dutz, and S. Göbel. Ein smartphone-basiertes framework für patientenfernüberwachung. *Mensch und Computer 2016–Workshopband*, 2016.

[33] T. Dutz, **Garcia-Agundez, Augusto**, S. Hardy, S. Göbel, and R. Steinmetz. Towards effective interventive health applications: On the problem of user triggering. In *International Conference on Distributed, Ambient, and Pervasive Interactions*, pages 245–256. Springer, 2016.

[34] J. G. Restrepo, C. Martínez, **Garcia-Agundez, Augusto**, E. Gaviria, J. J. Laguna, E. García-Martín, and J. A. Agúndez. Cytochrome p450 cyp2b6 genotypes and haplotypes in a colombian population: identification of novel variant cyp2b6 alleles. *Pharmacogenetics and genomics*, 21(12):773–778, 2011.

* Denotes equal collaboration

Accepted for Publication

L. Mercurio, **Garcia-Agundez, Augusto**, et al. Substance Use Identification Improves with Text-Recognition Modeling Compared to Identification by Structured Diagnoses: A MIMIC-III Database Pilot.

J. Pourian, **Garcia-Agundez, Augusto**, et al. To SNAP or Not to SNAP: Examining Safety Net Antibiotic Prescription Patterns in Pediatric Acute Otitis Media Using a Large Language Model.

In Review / In Preparation

Garcia-Agundez, Augusto, et al. Long Attention in Clinical Text Encoders: An Analysis of Cost and Benefit.

Garcia-Agundez, Augusto, D. Cohen, et al. Beyond Entropy: Optimizing Few-Shot Language Regression with Strategic Example Selection.

M. Seelemann, **Garcia-Agundez, Augusto**, et al. Automatically Identifying Fraudulent Papers Using Encoders: a Pilot Trial.

Garcia-Agundez, Augusto, D. Cohen, et al. Identifying Latent Clinical Subpopulations Through Invariant Learning.