Heitor Rapela Medeiros

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Education

École de technologie supérieure (ÉTS Montreal)　　　　　　　　Montreal, Quebec, CA
Ph.D. (GPA: 3.7/4.3) Advisors: Marco Pedersoli & Eric Granger　　　　　　2021/09 – 2024/12

Universidade Federal de Pernambuco (UFPE)　　　　　　Recife, Pernambuco, BRA
Master of Science in Computer Science (GPA: 10.0/10.0). Advisor: Hansenclever F. Bassani　2018/03 – 2020/08
Bachelor of Science in Computer Engineering (GPA: 7.7/10.0). Advisor: Hansenclever F. Bassani　2012/02 – 2017/07

Work Experience

Distech Controls (Deep Learning PhD Researcher)　　　　　　Montreal, Québec, CA
- First Ph.D. student in the Distech/ÉTS Controls Industrial Chair.　　　　　2021/09 – Present
- Developed Infrared models for Person Detection inside smart buildings using low-cost Edge Devices.
- Developed the large annotation detection model, reducing the annotation cost.

Neurotech (Junior Data Engineer at Neurolake)　　　　　　Recife, Pernambuco, BRA
- Work with Extract, Transform and Load.　　　　　　　　　　2020/09 – 2021/04
- Ingest/consumption in the data lake with SQL/PySpark.
- Create variables and data books to be used by all Neurolake squads.

Centro de Tecnologias Estratégicas do Nordeste (CETENE) - Deep Learning Researcher Recife, Pernambuco, BRA
- Developing Deep Learning models for embedded systems using Genetic Programming　　2018/01 – 2019/11

Motorola Brazil Research (BRRES) - Software Engineering　　　　Recife, Pernambuco, BRA
- Developed BRRES log-base simulation system to simulate 4G indoor networks using intern tools.　2016/06 – 2017/02

Publications

- **Medeiros H. R.** et al. "MiPa: Mixed Patch Infrared-Visible Modality Agnostic Object Detection". **Early Accepted (12.1%)** for IEEE/CVF Winter Conference on Applications of Computer Vision. **(WACV), 2025**.

- **Medeiros H. R.** et al. "Modality Translation for Object Detection Adaptation Without Forgetting Prior Knowledge". Accepted for European Conference on Computer Vision (2024). **(ECCV), 2024**.

- **Medeiros H. R.**, Peña, Fidel A., Aminbeidokhti M., Dubail T., Granger E., Pedersoli M. "HalluciDet: Hallucinating RGB Modality for Person Detection Through Privileged Information". Accepted for IEEE/CVF Winter Conference on Applications of Computer Vision. **(WACV), 2024**.

- Aminbeidokhti M., Peña, Fidel A., **Medeiros H. R.**, Dubail T., Granger E., Pedersoli M. "Domain Generalization by Rejecting Extreme Augmentations". Accepted for IEEE/CVF Winter Conference on Applications of Computer Vision. **(WACV), 2024**.

- Peña, Fidel A., **Medeiros H. R.**, Dubail T., Aminbeidokhti M., Granger E., Pedersoli M. "Re-basin via implicit Sinkhorn differentiation." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. **(CVPR), 2023**.

- Dubail T., Peña F. A. G, **Medeiros H. R.**, Aminbeidokhti M., Granger E., Pedersoli M. "Privacy-Preserving Person Detection Using Low-Resolution Infrared Cameras." **(RWS/ECCV), 2022**.

- **Medeiros, H. R**, Braga, P. H.., & Bassani, H. F. "Deep Clustering Self-Organizing Maps with Relevance Learning." **(LatinX/ICML), 2020**.

- Braga, P. H., **Medeiros, H. R.**, & Bassani, H. F. "Deep Categorization with Self-Supervised Self-Organizing Maps." **(IJCNN), 2020**.

- Braga, P. H., **Medeiros, H. R.**, & Bassani, H. F. "Backpropagating the Unsupervised Error of Self-Organizing Maps to Deep Neural Networks". **(LatinX/NeurIPS), 2019**.

- Bassani, H. F., Delgado, R. A., Junior, J. N. D. O. L., **Medeiros, H. R.**, Braga, P. H., & Tapp, A. (2019). "Learning to Play Soccer by Reinforcement and Applying Sim-to-Real to Compete in the Real World". **(LatinX/NeurIPS), 2019**.

- **Medeiros, H. R.**, de Oliveira, F. D., Bassani, H. F., & Araujo, A. F. (2019). "Dynamic topology and relevance learning SOM-based algorithm for image clustering tasks." Computer Vision and Image Understanding, 179, 19-30. **(CVIU), 2019**.

- de Oliveira Junior, L. A., **Medeiros, H. R.**, Macêdo, D., Zanchettin, C., Oliveira, A. L., & Ludermir, T. (2018, July). "SegNetRes-CRF: A Deep Convolutional Encoder-Decoder Architecture for Semantic Image Segmentation". In 2018 International Joint Conference on Neural Networks (pp. 1-6). IEEE. **(IJCNN), 2018**.

Major Projects

RobôCIn - A research team that creates robots that play soccer autonomously. Recife, Pernambuco, BRA
- Designed and developed the computer vision system of VSSS IEEE team. 2015/11 - 2021/11
- Awarded with **fifth place** in **Latin American IEEE Soccer** among 23 teams (2017).

Healthy Life System - Indoor System to measure quality of air Recife, Pernambuco, BRA
- Developed the mapping algorithm to measure CO, CO2, and dust sensor. 2016/03 - 2016/09
- Project under **National Patent: BR102016024721-7**

Handy System - Wearable system to assist the mobility impaired Recife, Pernambuco, BRA
- Developed the control system of the wearable system and each sensor embedded. 2015/03 − 2015/12
- Finalist Project at **Intel Embedded Systems** among 100 teams **(2015)**.

Scholarships

- **École de technologie supérieure [ÉTS]** - $25,000$**CAD** per year for my Ph.D, half payed by school and the other half by Distech Controls Company project.
- **Coordenaçao de Aperfeiçoamento de Pessoal de Nivel Superior [CAPES]** - Approved **first place** in Machine Learning Ph.D. of Universidade Federal de Pernambuco with **a full scholarship from CAPES**, but I refused to do my Ph.D. at ÉTS. This scholarship from CAPES is the best one in Brazil. It is a highly competitive scholarship.
- **Universidade Federal de Minas Gerais [UFMG]** - Received $12,370$**CAD** per year to do research at CETENE alongside my master's degree.
- **Fundaçao de Apoio ao Desenvolvimento da Universidade Federal de Pernambuco [FADE/UFPE]** - Received $9,475$**CAD** to do my master degree in Brazil. **This scholarship is ranked among the best students of the program**.

Awards

- **Top 1 solo** (1st of 901 teams) at Ordinal Regression with a Tabular Wine Quality Dataset PS3E5 **(Kaggle/2023)**.
- **Top 9%** (381st of 4373 teams) at Mechanisms of Action (MoA) **(Kaggle/2020).**
- **Top 6%** (112th of 2172 teams) at H. P. A. Image Classification **(Kaggle/2019).**
- **Third place** in **SSL RoboCup** Sydney/Australia **(2019).**
- **First place** in **Microsoft Bot-ando a mão na massa** at CIn/UFPE **(2019).**
- **Third place** from Brazil at **Google Hash Code (2019)**.

Volunteer

- **Top** Volunteer at **CVPR LatinX in AI 2024**
- **NeurIPS (2020)**, **LatinX in AI - ICML (2020)/ICLR (2020)**, **Session Chair WCCI (2020)**.
- **Deep Learning + Reinforcement Learning (DLRL) Summer School 2020** (Participated remote **CIFAR/MILA summer school**)
- **Neuromatch Academy 2020** course organized by professor Konrad Kording - Participated in the first Neuromatch remote with the project being mentioned on the final live as **one of the best projects of the course**.

Reviewer

- WACV (2024/2023), RWS-WACV (2023), ICPRAI (2022), ML Retrospectives NeurIPS (2020).
- **LatinX** at @NeurIPS (2022/2020), @ECCV (2022) and @ICML (2020).

Skills Technologies

- Python (6 years), C/C++ (12 years). Pytorch, Keras, OpenCV, TF, TF-lite, SQL, Arduino, Git, Unix/Bash.
- English (Fluent), Portuguese (Native).