Recife - PE, Brazil
(+55) 61 999270831
jonathanalis@gmail.com
orcid.org/0000-0003-1680-6327
github.com/JonathanAlis

Jonathan Lima

Objectives

Computer Science Ph.D. specializing in computer vision, multimedia signal processing, deep learning, and NLP, I am eager to contribute to research in computer vision and machine learning. Seeking roles in both industry and academia, my goal is to make meaningful contributions to innovative projects in these fields.

Education

August 2014 – Sept. 2019 **University of Brasilia (UnB)**,
Computer science department, Computer Science PhD
Title: Digital filtering methods in compressed sensing for magnetic resonance imaging reconstruction

June 2018 – January 2019 **University of Texas at El Paso (UTEP)**,
Electrical and Computer Engineering Department,
PhD Interchange period

Jan 2012 – August 2014 **University of Brasilia (UnB)**,
Computer science department, Computer Science Master's
Title (translated): Per-pixel mirror-based measuring: A new method for high-speed video acquisition

August 2008 – Dec. 2011 **University of Brasilia (UnB)**,
Computer science department, Computer Science Bachelor
Title (translated): Application of the constant-Q Transform with fixed window length in the mutiple pitch recognition in audio signals.

Experience

May 2024 – Current **Computer Vision Consultant**, IBGE
Machine Learning and Computer Vision Consultant, acting in research and development of object detection and segmentation in the satellite image domain for the IBGE's *Áreas Urbanizadas* project.
- Research and development of DL methods for satellite image segmentation, such as Unet, HRNet and SAM.
- Develop, maintain and document Python/Pytorch code.
- Write scientific documentation.

August 2020 – Sept. 2024 **Postdoctoral Research Assistant** , AI.Lab, FGA - UnB
Machine Learning and NLP Researcher, acting in legal text classification and clustering for a couple projects for Brazilian courts, such as TST and CNJ.
- AI Coordinator for the TST's *Sabiá* Project, focused on legal text retrieval and similarity analysis on embedding space.
- Use/Train/finetune models like TFIDF, xgboost, BERT, Llama.
- Coordinate small research and development teams on Machine Learning applications in NLP.
- Develop, maintain and document Python code.
- Write scientific papers.

June 2011 – Jan. 2014 **Software Developer**, ITAE, CDT - UnB
Developer of Batalha ITAE, a educational game for entrepreneurship learning.
- Develop, maintain and document the game software, using C/C++, SVN and Qt.
- Laboratory maintenance, monitoring of the games sessions.
- Audio sequences editing for the animations.

Faculty teaching assitant, University of Brasilia

Part time faculty teaching assistant many times during undergrad and grad courses, in different disciplines.

- Mar 2008 – Jun 2009, Differential equations.
- Aug 2010 – Nov 2010, Mathematical physics.
- Mar 2011 – Jun 2011, Audio synthesis.
- Aug 2011 – Nov 2011, Complex calculus.
- Mar 2012 – Jun 2012, Multimedia signal processing.
- Aug 2014 – Nov 2014, Image processing.

Feb. 2008 – July 2008 **High school teaching assitant**, ALUB, Taguatinga, DF

Part time maths and physics teaching assistant.

Journal Publications

2024 **SynFlowMap: A synchronized optical flow remapping for video motion magnification**, *Lima, J.A.S., da Silva, R., Miosso, C.J., Farias, M.C.Q.*, Signal Processing: Image Communication, p. 117203, 2024., https://www.sciencedirect.com/science/article/pii/S0923596524001048

- Developed the methods, the database, performed the experiments and the computational implementation in Python and wrote the paper.

2023 **The Influence of Magnetic Resonance Imaging Artifacts on CNN-Based Brain Cancer Detection Algorithms**, Farias, M. C. Q.; de Castro Oliveira, P. H.; dos Santos Lopes, G.; Miosso, C. J.; Lima, J. A., Computational Mathematics and Modeling, p. 1-19, 2023

2021 **Leveraging effectiveness and efficiency in Page Stream Deep Segmentation.**, *Braz, F. A.; da Silva, N. C.; Lima, J. A. S.*, Engineering Applications of Artificial Intelligence, v. 105, p. 104394, 2021., https://www.sciencedirect.com/science/article/abs/pii/S0952197621002426

- Help developing the ideas and methods and the computational implementation in Python/Pytorch.
- Participate performing the experiments and writting the paper.

2020 **Isotropic and anisotropic filtering norm-minimization: A generalization of the TV and TGV minimizations using NESTA**, Lima, J.A.S., da Silva, F.B., von Borries, R., Miosso, C.J., Farias, M.C.Q., Signal Processing: Image Communication

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.

2017 **Per-Pixel Mirror-Based Method for High-Speed Video Acquisition**, *Lima, J.A.S., Miosso, C.J., Farias, M.C.Q*, JOURNAL OF VISUAL COMMUNICATION AND IMAGE REPRESENTATION , v. 1, p. 1, 2017, http://www.sciencedirect.com/science/article/pii/S1047320317301050

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.

Conference Papers

2022 **Undersampled Magnetic Resonance Image Reconstructions Based on a Combination of U-Nets and L1, L2, and TV Optimizations** , Aline A.S. Thomaz, Lima, J.A.S., Miosso, C.J., Farias, M.C.Q., Andrey S. Krilov, Yong Ding, 2022 IEEE International Conference on Imaging Systems and Techniques (IST), 2022, Virtual

- Developed the method and the computational implementation in Python.
- Performed the experiments and wrote the paper.

2020 **Hybrid Motion Magnification based on Same-Frame Optical Flow Computations**, Lima, J.A.S., Miosso, C.J., Farias, M.C.Q., 2020 IEEE 22nd International Workshop on Multimedia Signal Processing (MMSP), 2020, Tampere, Finand

- Developed the method and the computational implementation in MATLAB/Python.
- Performed the experiments and wrote the paper.
- Presented the work virtually.

2018 **Evaluation of Different Types of Filters in Magnetic Resonance Imaging Using Compressive Sensing with Pre-Filtering**, Lima, J.A.S., von Borries, R., Miosso, C.J., Farias, M.C.Q., 2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2018, Honolulu

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.
- Attended to the conference and presented the work.

2017 **Avaliação de filtros de decomposição wavelet para reconstrução de imagens de Ressonância Magnética com Base em Compressive Sensing com Pré-Filtragem**, Lima, J.A.S., Miosso, C.J., Farias, M.C.Q., Congresso Brasileiro de Eletromiografia e Cinesiologia (COBEC) e o Simpósio de Engenharia Biomédica (SEB) COBECSEB, 2018, Uberlândia.

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.
- Attended to the conference and presented the work.

2015 **REA-WSN: Intercluster routing algorithm for energy optimization in wireless sensor networks**, Lima, Paula; Lima, Jonathan; Solis, Priscila, 2015 7th IEEE LatinAmerican Conference on Communications (LATINCOM), 2015, Arequipa

- Part of computational implementation.

2014 **Per-Pixel Mirror-Based Acquisition Method for Video Compressive Sensing**, Lima, J.A.S., Miosso, C.J., Farias, M.C.Q., Proc. of EUSIPCO 2014, 2014, Lisbon, Portugal

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.
- Attended to the conference and presented the work.

2012 **Transformada Q constante de comprimento de janela fixo**, Lima, J.A.S., Farias, M.C.Q., Brandao, M.C.P., Congresso de Engenharia de Áudio da AES-Brasil, 2012, São Paulo

- Developed the method and the computational implementation in MATLAB.
- Performed the experiments and wrote the paper.
- Attended to the conference and presented the work.

Paper revision

2021-2024 **IEEE International Conference on Image Processing (IEEE ICIP)**

Skills

Programming	Python (5 year experience), Matlab (7 years experience), C/C++(2 years experience), C#, Java
Frameworks	PyTorch (4 years experience), Tensorflow, Keras
Utilities	OpenCV, Git, Unity, GLSL, LaTeX, Tikz
Communication	Portuguese, English

Relevant Courses

Classroom	Linear Algebra, Signal and Image Processing, Stochastic Processes, Computer Vision, Game Development
Extra curricular	Python, Machine Learning, Deep Learning, OpenCV, Arduino

References

Mylene Farias,
Associate Professor,
Electrical Engeneering Department, UnB,
mylene@ene.unb.br

Cristiano Miosso,
Adjunct Professor,
Biomedical Engineering Graduate Program, UnB,
miosso@ieee.com

Fabrício Braz,
Adjunct Professor,
Software Engineering, UnB,
fabraz@unb.br