Daniel H. Moreira

Assistant Professor at Loyola University Chicago

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Google Scholar: https://tinyurl.com/ymk4x387

Education

PhD Degree University of Campinas (Unicamp), Institute of Computing (IC), Campinas, SP, Brazil (2013 - 2016)

Computer Science, Sensitive-Video Analysis. Advisor: Dr. Anderson Rocha / Co-advisor: Dr. Siome

Goldenstein, GPA: 4.0.

MSc Degree Federal University of Pernambuco (UFPE), Center of Informatics (CIn), Recife, PE, Brazil

(2006 - 2008)Computer Science, Multi-Agent Patrolling. Advisor: Dr. Geber Ramalho. GPA: 4.0.

BSc Degree Federal University of Pará (UFPA), Institute of Exact and Natural Sciences (ICEN), Belém, PA, Brazil

(2001 - 2005)Computer Science. GPA: 3.88.

Work Experience

Assistant Professor Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

(2022 – present) Tenure-track Researcher and Instructor.

Assistant Research University of Notre Dame, Department of Computer Science and Engineering, and Center for Research

Professor Computing, Notre Dame, IN, USA

(2020 - 2022)Researcher and Instructor (Media Forensics, Computer Vision, Machine Learning, and Biometrics).

University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA Research Scholar

(2016 - 2020)Computer Vision Research Laboratory (CVRL). Advisors: Drs. Walter Scheirer, Adam Czajka, and

Patrick Flynn. Postdoctoral researcher.

Research Fellow University of Campinas (Unicamp), Institute of Computing (IC), Campinas, SP, Brazil

(2013 - 2016)Reasoning for Complex Data Laboratory (RECOD). Advisor: Dr. Anderson Rocha.

PhD student.

Instructor Centro Universitário do Estado do Pará (CESUPA), Belém, PA, Brazil

(2012 - 2012)Systems and Database Programming 40h module within the Corporate Databases Graduate Program.

Instructor.

Systems Analyst Federal Data Processing Service (SERPRO), Belém, PA, Brazil

(2009 - 2013)Full-stack lead developer.

Cobra Tecnologia S.A., Belém, PA, Brazil Systems Analyst

(2008 - 2009)Back-end programmer.

Research Fellow Federal University of Pernambuco (UFPE), Recife, PE, Brazil

Center of Informatics (CIn). Advisor: Dr. Geber Ramalho.

MSc student.

Publications

Refereed Journal Articles

(2006 - 2008)

João Cardenuto, Daniel Moreira, Anderson Rocha

Unveiling scientific articles from paper mills with provenance analysis.

[J.10] PLOS One 19, 10, pp. 1-28.

2023 João Cardenuto, Jing Yang, Rafael Padilha, Renjie Wan, Daniel Moreira, Haoliang Li, Shiqi Wang, Fernanda Andaló, Sébastien Marcel, Anderson Rocha.

The Age of Synthetic Realities: Challenges and Opportunities.

[J.9] APSIPA Transactions on Signal and Information Processing 12, 1, pp. 1 – 62.

Refereed Journal Articles (cont.)

Daniel Moreira, João Cardenuto, Ruiting Shao, Sriram Baireddy, Davide Cozzolino, Diego Gragnaniello, Wael Abd-Almageed, Paolo Bestagini, Stefano Tubaro, Anderson Rocha, Walter Scheirer, Luisa Verdoliva, Edward Delp. *SILA: a system for scientific image analysis.*

[J.8] Nature Scientific Reports 12, 18306, pp. 1 – 15.

Sara Mandelli, Davide Cozzolino, Edoardo Cannas, João Cardenuto, **Daniel Moreira**, Paolo Bestagini,

Walter Scheirer, Anderson Rocha, Luisa Verdoliva, Stefano Tubaro, Edward Delp.

Forensic Analysis of Synthetically Generated Western Blot Images.

[J.7] IEEE Access 10, 1, pp. 59919 – 59932.

2021 Joel Brogan, Aparna Bharati, **Daniel Moreira**, Kevin Bowyer, Patrick Flynn, Anderson Rocha, Walter Scheirer. *Fast Local Spatial Verification for Feature-Agnostic Large-Scale Image Retrieval.*

[J.6] IEEE Transactions on Image Processing (T-IP) 30, 1, pp. 6892 – 6905.

Aparna Bharati, Daniel Moreira, Patrick Flynn, Anderson Rocha, Kevin Bowyer, Walter Scheirer.

Transformation-Aware Embeddings for Image Provenance.

[J.5] IEEE Transactions on Information Forensics and Security (T-IFS) 16, 1, pp. 2493 – 2507.

2019 Daniel Moreira, Sandra Avila, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

Multimodal Data Fusion for Sensitive Scene Localization.

[J.4] Elsevier Information Fusion (IF) 45, 1, pp. 307 – 323.

2018 Daniel Moreira, Aparna Bharati, Joel Brogan, Allan Pinto, Michael Parowski, Kevin Bowyer, Patrick Flynn, Anderson Rocha, Walter Scheirer.

Image Provenance Analysis at Scale.

[J.3] IEEE Transactions on Image Processing (T-IP) 27, 12, pp. 6109 – 6123.

2017 Mauricio Perez, Sandra Avila, **Daniel Moreira**, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

Video pornography detection through deep learning techniques and motion information.

[J.2] Elsevier Neurocomputing 230, 1, pp. 279 – 293.

Daniel Moreira, Sandra Avila, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

Pornography Classification: The Hidden Clues in Video Space-Time.

[J.1] Elsevier Forensic Science International (FSI) 268, 1, pp. 46 – 61.

Refereed Conference Papers

2024 Joshua Krinsky, Alan Bettis, Qiuyu Tang, Daniel Moreira, Aparna Bharati.

Exploring saliency bias in manipulation detection.

[C.11] In: IEEE International Conference on Image Processing (ICIP), Abu Dhabi, United Arab Emirates.

2023 William Theisen, Daniel Gonzalez Cedre, Zachariah Carmichael, **Daniel Moreira**, Tim Weninger, Walter Scheirer. *Motif Mining: Finding and Summarizing Remixed Image Content.*

[C.10] In: IEEE Winter Conference on Applications of Computer Vision (WACV), Hawaii County, USA.

William Theisen, Joel Brogan, Pamela Bilo Thomas, **Daniel Moreira**, Pascal Phoa, Tim Weninger, Walter Scheirer. Automatic Discovery of Meme Genres with Diverse Appearances.

[C.9] In: AAAI International Conference on Web and Social Media (ICWSM), held virtually.

2019 Daniel Moreira, Mateusz Trokielewicz, Adam Czajka, Kevin Bowyer, Patrick Flynn.

Performance of Humans in Iris Recognition: The Impact of Iris Condition and Annotation-Driven Verification. [C.8] In: IEEE Winter Conference on Applications of Computer Vision (WACV), Hawaii County, USA.

2017 Adam Czajka, **Daniel Moreira**, Kevin Bowyer, Patrick Flynn.

Domain-Specific Human-Inspired Binarized Statistical Image Features for Iris Recognition.

[C.7] In: IEEE Winter Conference on Applications of Computer Vision (WACV), Hawaii County, USA.

Aparna Bharati, **Daniel Moreira**, Joel Brogan, Patricia Hale, Kevin Bowyer, Patrick Flynn, Anderson Rocha, Walter Scheirer.

Beyond Pixels: Image Provenance Analysis Leveraging Metadata.

[C.6] In: IEEE Winter Conference on Applications of Computer Vision (WACV), Hawaii County, USA.

Refereed Conference Papers (cont.)

2017 Daniel Moreira, Sandra Avila, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

Temporal Robust Features for Violence Detection.

[C.5] In: IEEE Winter Conference on Applications of Computer Vision (WACV), Santa Rosa, USA.

Aparna Bharati, **Daniel Moreira**, Allan Pinto, Joel Brogan, Kevin Bowyer, Patrick Flynn, Walter Scheirer, Anderson Rocha.

U-Phylogeny: Undirected provenance graph construction in the wild.

[C.4] In: IEEE International Conference on Image Processing (ICIP), Beijing, China.

Allan Pinto, **Daniel Moreira**, Aparna Bharati, Joel Brogan, Kevin Bowyer, Patrick Flynn, Walter Scheirer, Anderson Rocha.

Provenance filtering for multimedia phylogeny.

[C.3] In: IEEE International Conference on Image Processing (ICIP), Beijing, China.

Joel Brogan, Paolo Bestagini, Aparna Bharati, Allan Pinto, **Daniel Moreira**, Kevin Bowyer, Patrick Flynn, Anderson Rocha, Walter Scheirer.

Spotting the difference: Context retrieval and analysis for improved forgery detection and localization.

[C.2] In: IEEE International Conference on Image Processing (ICIP), Beijing, China.

2009 Daniel Moreira, Geber Ramalho, Patricia Tedesco.

Establishment of Multi-Agent Patrolling as a Benchmark for Multi-Agent Systems.

[C.1] In: AAAI International Conference on Agents and Artificial Intelligence (ICAART), Porto, Portugal.

Refereed Workshop Papers

2025 João Cardenuto, Joshua Krinsky, Lucas Nogueira, Aparna Bharati, **Daniel Moreira**.

Implications of Neural Compression to Scientific Images

[W.8] In: ACM Workshop on Information Hiding and Multimedia Security (IH&MMSec), San Jose, USA.

2024 João Cardenuto, Sara Mandelli, **Daniel Moreira**, Paolo Bestagini, Edward Delp, Anderson Rocha.

Explainable artifacts for synthetic Western blot source attribution.

[W.7] In: IEEE International Workshop on Information Forensics and Security (WIFS), Rome, Italy.

Anmol Manjunath, Viola Negroni, Sara Mandelli, **Daniel Moreira**, Paolo Bestagini.

Localization of synthetic manipulations in Western blot images.

[W.6] In: IEEE International Workshop on Information Forensics and Security (WIFS), Rome, Italy.

2023 Aidan Boyd, Daniel Moreira, Andrey Kuehlkamp, Kevin Bowyer, Adam Czajka.

Human Saliency-driven Patch-based Matching for Interpretable Post-mortem Iris Recognition.

[W.5] In: IEEE Winter Conference on Applications of Computer Vision (WACV) Workshop, Hawaii County, USA.

2018 Nathaniel Blanchard, **Daniel Moreira**, Aparna Bharati, Walter Scheirer.

Getting the subtext without the text: Scalable multimodal sentiment classification from visual and acoustic modalities.

[W.4] In: ACL Grand Challenge and Workshop on Human Multimodal Language, Melbourne, Australia.

2017 Daniel Moreira, Siome Goldenstein, Anderson Rocha.

Sensitive-Video Analysis.

[W.3] In: SBC Contest of Theses and Dissertations (CTD), São Paulo, Brazil.

Daniel Moreira, Sandra Avila, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

RECOD at MediaEval 2015: Affective Impact of Movies Task.

[W.2] In: MediaEval Workshop, Wurzen, Germany.

2014 Sandra Avila, **Daniel Moreira**, Mauricio Perez, Daniel Moraes, Isabela Cota, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

RECOD at MediaEval 2014: Violent Scenes Detection Task.

[W.1] In: MediaEval Workshop, Barcelona, Spain.

Invited Book Chapters

Daniel Moreira, William Theisen, Walter Scheirer, Aparna Bharati, Joel Brogan, Anderson Rocha. *Image Provenance Analysis*.

[B.1] In: Sencar, Verdoliva, and Memon (editors), Multimedia Forensics, pp. 389 – 432. Springer.

Editorial

2024 Daniel Moreira, Sébastien Marcel, Anderson Rocha.

Synthetic Realities and Artificial Intelligence-generated Contents.

[E.2] IEEE Security & Privacy 22, Special Issue 3, pp. 7 – 10.

2023 Daniel Moreira, Aparna Bharati, Cecilia Pasquini, Yassine Yousfi.

IH&MMSec'23: Proceedings of the 2023 ACM Workshop on Information Hiding and Multimedia Security. [E.1] In: ACM Workshop on Information Hiding and Multimedia Security (IH&MMSec), Chicago, USA.

Patents

2019 Sandra Avila, **Daniel Moreira**, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein, Anderson Rocha.

Multimodal and Real-Time Method for Filtering Sensitive Media.

[P.2] US010194203B2, USA. Filed June 30th, 2016.

2017 Sandra Avila, **Daniel Moreira**, Mauricio Perez, Daniel Moraes, Vanessa Testoni, Eduardo Valle, Siome Goldenstein. Anderson Rocha.

Método Multimodal e em Tempo Real para Filtragem de Conteúdo Sensível.

[P.1] BR1020160072654A2, Brazil. Filed April 1st, 2016.

Research Experience

Scientific Integrity

System for Scientific Image Analysis Project

(2019 - 2024) Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA Sponsor: Department of Health and Human Services (HHS) and Air Force Research Laboratory (AFRL). Collaborators: Purdue University, University of Southern California (USC), University Federico II of Naples, Politecnico di Milano, University of Campinas (Unicamp).

Co-Principal Investigator.

SemaFor

Semantic Forensics Project

(2020 – 2024) University of Notre Dame Do

University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA Sponsor: Defense Advanced Research Projects Agency (DARPA).

Collaborators: Purdue University, University of Notre Dame, University Federico II of Naples, Politecnico di Milano, University of Siena, University of Campinas (Unicamp).

Co-Principal Investigator.

MediFor Media Forensics Project

(2016 – 2020) University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA

Sponsors: Defense Advanced Research Projects Agency (DARPA) and Air Force Research Lab (AFRL). Collaborators: Purdue University, University of Southern California (USC), New York University (NYU),

University of Siena, Politecnico di Milano, University of Campinas (Unicamp).

Postdoctoral researcher. Advisor: Dr. Walter Scheirer.

SREFV Synthesis of Realistic Example Face Videos Project

(2018 – 2019) University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA

Collaborators: FBI Biometric Center of Excellence, West Virginia University (WVU).

Postdoctoral researcher. Advisor: Dr. Patrick Flynn.

TSHEPII Tool Supporting the Human Examination of Post-Mortem Iris Images Project

(2017 – 2018) University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA

Collaborators: FBI Biometric Center of Excellence, West Virginia University (WVU).

Postdoctoral researcher. Advisor: Dr. Adam Czajka.

SMA Sensitive Media Analysis Project

(2014 – 2016) University of Campinas (Unicamp), Institute of Computing (IC), Campinas, SP, Brazil

Sponsor: Samsung Electronics.

PhD student. Advisor: Dr. Anderson Rocha.

Teaching Experience

Machine Learning

ing Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

(Spring 2025, COMP 379 / 479 undergraduate and graduate joint course.

Spring 2024) *Instructor*.

Learning the Shell Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

(Fall 2022 to COMP 141 / 400D undergraduate and graduate joint course.

Spring 2025) Instructor.

Biometrics Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

(Fall 2024, COMP 388 / 488 undergraduate and graduate joint course.

Fall 2023) *Instructor*: Material available at https://danielmoreira.github.io/teaching/biometrics-aut24/.

Computing for the Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

Sciences COMP 180 undergraduate course.

(Spring 2023) Instructor.

Computer Vision Loyola University Chicago, Department of Computer Science, Chicago, IL, USA

Applications COMP 388 / 488 undergraduate and graduate joint course.

(Fall 2022) Instructor. Material available at https://danielmoreira.github.io/teaching/cvapp-aut22/.

Biometrics University of Notre Dame, Department of Computer Science and Engineering, Notre Dame, IN, USA

(Spring 2022, CSE 40537 / 60537 undergraduate and graduate joint course.

Spring 2020) *Instructor*: Material available at https://danielmoreira.github.io/teaching/biometrics-spr22/.

Data Structures University of Campinas (Unicamp), Institute of Computing (IC), Campinas, SP, Brazil

(Spring 2015) MC202 undergraduate course. Instructor: Dr. Anderson Rocha.

Teaching Assistant.

Database Centro Universitário do Estado do Pará (CESUPA), Belém, PA, Brazil

Programming Systems and Database Programming 40-h module, within the Corporate Databases Graduate Program.

(Spring and Fall 2012) Instructor.

Teaching Areas

Biometrics

Computer Vision and Image Processing

Machine Learning, Pattern Recognition, and Artificial Intelligence

Media Forensics

Database Concepts and Systems

Data Structures, Programming Paradigms, and Programming Languages: C, C++, Java, Python, Shell Scripting

Elements, Fundamentals, and Introduction to Computing

Advising

Graduate Student João Cardenuto. Doctoral, co-advised with Anderson Rocha, University of Campinas, defended Nov. 2024.

Undergraduate Alisa Samakhval, Provost Fellowship, Loyola University Chicago, 2026.

Students Abigail Daman, Undergraduate Summer Research Experience (USRE), Loyola University Chicago, 2025.

Rehonoma Jahin, Provost Fellowship, Loyola University Chicago, 2025.

Matt Hyatt, Undergraduate, Scientific Integrity project, Loyola University Chicago, 2023. Yvette Diaz, Undergraduate, Scientific Integrity project, Loyola University Chicago, 2023.

Muhammad Khan, Undergraduate Summer Research Experience (USRE), Loyola University Chicago, 2023. Madison Pickett, Undergraduate Summer Research Experience (USRE), Loyola University Chicago, 2023.

Service

General Chair 11th ACM Workshop on Information Hiding and Multimedia Security (IH&MMSec), 2023.

Loyola University Chicago, Chicago, US.

Associate Editor IEEE Transactions on Information Forensics and Security (T-IFS) Journal, 2023 – present.

Elsevier Pattern Recognition, 2023 – present.

Guest Editor IEEE Security & Privacy Special Issue on Synthetic Realities and AI-generated Contents, 2024.

Reviewer IEEE Transactions on Information Forensics and Security (T-IFS) Journal.

(Journals) IEEE Transactions on Technology and Society (TTS) Journal.

Reviewer IEEE Transactions on Computers (TC) Journal.

(Journals, cont.) Elsevier Pattern Recognition (PR) Journal.

Elsevier Computer Vision and Image Understanding (CVIU) Journal.

Elsevier Journal of Visual Communication and Image Representation (JVCI).

Springer Signal, Image, and Video Processing (SIVP) Journal.

Springer European Conference on Computer Vision (ECCV), 2022.

Springer ECMLPKDD Workshop of Deep Learning and Multimedia Forensics, 2023.

Reviewer CVPR Workshop on Media Forensics (WMF), 2024, 2020 – 2022.

(Conferences) IAPR International Conference on Pattern Recognition (ICPR), 2022.

IEEE International Conference on Image Processing (ICIP), 2021.

IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2021 – 2024.

IEEE International Conference on Autonomous Systems (ICAS), 2021.

IEEE International Joint Conference on Biometrics (IJCB), 2023, 2022.

IEEE International Workshop on Information Forensics and Security (WIFS), 2022, 2021.

IEEE Winter Conference on Applications of Computer Vision (WACV), 2023, 2020.

IEEE WACV Workshop on Deepfakes and Presentation Attacks in Biometrics (DeepPAB), 2020.

ACM Workshop on Information Hiding and Multimedia Security (IH&MMSec), 2025, 2024.

ACM International Conference on Multimedia Retrieval, 2017.

SBC International Conference on Graphics, Patterns, and Images (SIBGRAPI), 2023, 2022.

Reviewer National Science Foundation (NSF) Panel. 2025.

(Grant Proposals) Cardinal Bernardin Cancer Center (CBCC) Seed Grant, Loyola University Chicago, 2025.

Technical IEEE Signal Processing Society, Education Center Editorial Board, 2022 – 2023.

Committee IEEE Information Forensics and Security, Technical Committee (IFS-TC), 2021 – 2023.

Thesis João Bachiega Jr. Doctoral, University of Brasilia (UnB), defended March 2025.

Committee Rachel Gordon. Master's, Loyola University Chicago, defended May 2024.

Edoardo Cannas. Doctoral, Politecnico di Milano, defended April 2024.

William Theisen. Doctoral, University of Notre Dame, defended April 2024.

Pedro Valois. Master's, University of Campinas (Unicamp), defended August 2022.

Proposal Deeksha Arun. Doctoral, University of Notre Dame, proposed March 2025.

Reader Mahsa Mitcheff. Doctoral, University of Notre Dame, proposed November 2024.

Gil de Carvalho. Master's, University of Campinas (Unicamp), proposed July 2024.

Edoardo Cannas. Doctoral, Politecnico di Milano, proposed November 2023.

João Bachiega Jr. Doctoral, University of Brasilia (UnB), proposed November 2022.

William Theisen. Doctoral, University of Notre Dame, proposed June 2022.

Samuel Grieggs. Doctoral, University of Notre Dame, proposed May 2021.

Thamiris Coelho. Master's, University of Campinas (Unicamp), proposed December 2021.

Pedro Valois. Master's, University of Campinas (Unicamp), proposed August 2021.

Faculty Search Algorithms Tenure-track Assistant Professor, Loyola University Chicago, 2024.

Committee Cybersecurity Tenure-track Assistant Professor, Loyola University Chicago, 2023.

Speaker GenAI in Higher Education: A Critical Approach, Workshop hosted by the Faculty Center for Ignatian Pedagogy (FCIP), Loyola University Chicago, 2025. Co-authored with Guofang Wan, Theodore Barnes,

Hong Ma, Jing Yang, and Eric Chan-Tin. Available at https://tinyurl.com/bdfjw5uu.

Scientific Integrity Verification Through Image Forensics, IEEE SPS-IFS TC Webinar, 2023.

Available at https://tinyurl.com/3ny56n5z and https://tinyurl.com/364fe9xy.

Fighting Scientific Misconduct with Media Forensics, 12th Annual Symposium on Digital Ethics, Loyola University Chicago, 2023.

Image Provenance Analysis for Disinformation Detection, Red Hat Research, 2022.

Co-authored with Walter Scheirer. Available at https://red.ht/3O97FKs.

Human-machine Pairing to Improve Computer Vision, IEEE International Joint Conference on Biometrics (IJCB) and IEEE Winter Conference on Applications of Computer Vision (WACV), 2022.

Co-authored with Adam Czajka, Kevin Bowyer, and Aidan Boyd. Available at https://tinyurl.com/vwyh74ur.

Honors and Awards

- 2025 St. Ignatius of Loyola Award for Excellence in Teaching, Rising Star. Loyola University Chicago.
- 2017 Best 2016 Brazilian PhD Thesis in Computer Science. Brazilian Computer Society (SBC).
- 2006 Honor Graduating Student in Computer Science. Brazilian Computer Society (SBC).

Technical Skills

Top Programming Languages: C, C++, Java, Python, and Matlab. Versed in: Unix shell scripting, Mathematica, SQL, Prolog, and Pascal. Sun Certified Programmer for the Java 2 Platform, Standard Edition 5.0, 2009.