

# Juanpablo Heredia

✉ jherediaparillo@gmail.com

🔗 juan1t0.github.io

🌐 juanpabloheredia18

🔗 juan1t0

🎓 Google Scholar

## Education

### Getulio Vargas Foundation (FGV), Visual Data Science Lab

PhD in Mathematical Modelling and Data Science

Supervisor: Prof. Jorge Poco

Rio de Janeiro, Brazil

Mar 2023 - Feb 2027

### Universidad Catolica San Pablo

BSc of Science in Computer Science

Supervisor: Prof. Regina Ticona

2nd in class

Arequipa, Peru

Jan 2016 - Feb 2021

## Research Projects

### Spatiotemporal forecasting with LLMs and knowledge graph reasoning

July 2025 – Present

Conduct literature review on spatiotemporal forecasting, LLM integration, and knowledge graphs.

Collect, preprocess, and curate data from multiple sources.

### Visual analytics system for exploring and explaining spatiotemporal anomalies

Feb 2025 – Aug 2025

Article accepted at SIBGRAPI 2025.

Modeled crime data as a spatiotemporal graph and applied STARMA procedure for anomaly detection.

Designed and implemented an interactive visualization system using *d3.js*.

Integrated LLM-based web search to generate contextual explanations from news and external events.

### Graph-based deep learning for spatiotemporal forecasting

Jul 2023 – Present

Applied geometric deep learning methods and state-of-the-art models to predict time series on graph nodes (spatiotemporal signals).

Achieved over 90% overall accuracy; however, local forecasting on sparse crime data hotspots remains below 40%.

Exploring extensions to topological deep learning with hypergraphs and multi-resolution architectures (e.g., U-Net variants).

### Participation in VAST challenge (Two Tasks)

May 2024 – Oct 2024

Final project for graduate course *Visual data analysis*; awarded the *Strong Data Enrichment Award*.

Developed visualization systems to explore and analyze bias and anomalies in knowledge graphs using fishing data.

### Emotion detection system for human-robot interaction

Oct 2021 – Jun 2022

Implemented a client-server architecture where a deep learning model processed camera images to detect emotions and adapt robot behavior accordingly.

### Multimodal emotion recognition from images

Mar 2020 – Aug 2021

Processed images to extract posture, facial, and background features; combined modalities using a multinomial distribution-based fusion mechanism.

### Comparison of human pose estimation methods

Jul 2019 – Dec 2019

Reproduced experiments with state-of-the-art computer vision models on images and videos.

## Publications

- **Juanpablo Heredia**, Edmundo Lopes-Silva, Yudith Cardinale, Jose Diaz-Amado, Irvin Dongo, Wilfredo Graterol, and Ana Aguilera. 2022. *Adaptive multimodal emotion detection architecture for social robots*. **Ieee Access**.
- **Juanpablo Heredia**, Yudith Cardinale, Irvin Dongo, and Jose Díaz-Amado. 2021. *A multi-modal visual emotion recognition method to instantiate an ontology*. In 16th **International conference on software technologies**.
- Diego Peña, Ana Aguilera, Irvin Dongo, **Juanpablo Heredia**, and Yudith Cardinale. 2023. *A framework to evaluate fusion methods for multimodal emotion recognition*. **IEEE Access**.
- **Juanpablo Heredia**, Yudith Cardinale, Irvin Dongo, Ana Aguilera, and Jose Diaz-Amado. *Multimodal emotional understanding in robotics*. 2022. In **SENTIRobots Workshop** at 18th International Conference on Intelligent Environments.

- Dany Diaz, Felipe Moreno-Vera, **Juanpablo Heredia**, Fabrício Venturim, and Jorge Poco. 2024. *FishBiasLens: Integrating Large Language Models and Visual Analytics for Bias Detection*. In **IEEE Visual Analytics Science and Technology VAST Challenge**.
- **Juanpablo Heredia**, Fabrício Venturim, Dany Diaz, Felipe Moreno-Vera, and Jorge Poco. 2024. *Tracking Overfishing: Visual Analytics of Suspicious Behaviors in Commercial Fishing Vessels*. In **IEEE Visual Analytics Science and Technology VAST Challenge**.

## Theses and Reports

---

- Juanpablo Andrew Heredia Parillo. 2021. *A multi-modal emotion recogniser based on the integration of multiple fusion methods*. BSc thesis, Catholic University San Pablo, Arequipa, Peru.
- Juanpablo Andrew Heredia Parillo. 2021. *An automatic emotion recognition system that uses the human body posture*. Undergraduate research, Catholic University San Pablo, Arequipa, Peru.

## Experience

---

<b>Teaching assistant</b> Getulio Vargas Foundation (FGV) Assisted in teaching the <i>Data visualization</i> undergraduate course (two semesters).	<b>Rio de Janeiro, Brazil</b> Feb 2024 – Jul 2024, Feb 2025 – Jul 2025
<b>Guest researcher (Internship)</b> Getulio Vargas Foundation (FGV) Developed an LLM-based chatbot to generate visualizations from natural language queries and CSV datasets.	<b>Rio de Janeiro, Brazil</b> Sep 2022 – Feb 2023
<b>Full stack developer</b> Inhogar Real Estate Built a website and CRM platform to support real estate operations and HR management.	<b>Arequipa, Peru</b> Sep 2022 – Feb 2023
<b>Research student</b> Catholic University San Pablo Conducted part-time pre-professional research in computer vision. Developed an image-based emotion recognition system using machine and deep learning; implemented experiments leading to scientific publications.	<b>Arequipa, Peru</b> Apr 2020 – May 2022

## Awards and Scholarships

---

<b>Best paper award</b> SIBGRAPI - Visualization & Computer Graphics Track.	<b>2025</b>
<b>Strong data enrichment award</b> IEEE VAST Challenge.	<b>2024</b>
<b>IEEE VIS diversity and inclusion award</b> Registration and accommodation grant for IEEE VIS 2024.	<b>2024</b>
<b>Direct PhD scholarship</b> São Paulo State Research Support Foundation (FAPESP): full scholarship with monthly stipend.	<b>Jun 2023 – May 2027</b>
<b>PhD scholarship</b> Getulio Vargas Foundation (FGV): tuition support.	<b>Mar 2023 – Feb 2027</b>
<b>Undergraduate thesis competition</b> Awarded 3rd place.	<b>2021</b>
<b>Academic distinguished undergraduate award</b> Ranked 2nd in my undergraduate class.	<b>Dec 2020</b>

## Skills

---

**Programming** Python, C++, Javascript, MATLAB/Scilab, LaTeX

**Machine Learning** PyTorch, scikit-learn, HuggingFace Transformers, TensorFlow, Keras

**Technologies** Git, Pandas, NumPy, Node.js, Django, Linux, GCS

**Languages** English (Intermediate/B2), Portuguese (Intermediate), Italian (Elementary), Spanish (Native)

Volunteering

---

<i>ICEC 2019</i> Volunteer at the 18th International Conference on Entertainment Computing.	<i>Arequipa, Peru, Nov 2019</i>
<i>JCSG 2019</i> Volunteer at the Joint Conference on Serious Games.	<i>Arequipa, Peru, Nov 2019</i>

Events, Schools, and Workshops Attended

---

<i>Machine Learning Summer School</i>	<i>Arequipa, Peru, Aug 2025</i>
<i>Summer School of Data Science</i>	<i>Rio de Janeiro, Brazil, Jan 2025</i>
<i>ACM Conference on Fairness, Accountability, and Transparency (FAccT)</i>	<i>Rio de Janeiro, Brazil, Jun 2024</i>