Brayan **Impatá**

Researcher & Engineer

Valencia, Spain

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Summary

Research engineer with 7+ years of experience in machine learning and computer vision, specializing in developing large-scale AI systems that bridge research and production. Expertise in training foundation models and designing data collection pipelines. Proven track record of leading high-impact initiatives from ideation to production across multi-org settings. Recognized technical leader with deep contributions to open research and business-critical ML applications.

Regular reviewer for top ML conferences (CVPR, ICCV, ECCV) specializing in vision and multi-modal systems.

Skills: Python, HuggingFace, Pytorch, AWS, C/C++, Data mining, Deep learning, Computer vision, Robotics, Multi-modal learning, GenAI.

Work Experience

Amazon
Madrid, Spain

Applied Scientist — *Oct. 2020 - Present*

- Led research and development of models that impact data quality of millions of products weekly, achieving 90% precision in production at +20 marketplaces worldwide. At this initiative, also introduced semi-supervised learning techniques that reduced annotation costs by 50% while maintaining precision rates of trained models. Supported 2 organizations scale scope of products covered with this work by x10.
- Pioneered evaluation frameworks and metrics to measure model performance in production environments, reducing scientist time spent on model degradation detection and root cause analysis from +1 week to 1 day.
- Led development and production roll-out for problem requiring the detection of visual features under data scarcity regimes, achieving +80% precision with one-shot learning. This opened a business opportunity at multiple organizations worldwide.
- Defined roadmap for multi-org GenAI foundational model development across 3 international science teams, coordinated tasks across scientists and defined shared evaluation metrics and benchmarks.
- Involved in hiring of +60 scientists and ML engineers across the company, as well as mentoring +10 junior scientists across Amazon in Europe.
- Owner of technical demos and reporting to non-technical directors and business stakeholders given my bar-raising speaking and writing skills.

University of Alicante
Alicante, Spain

Robotics Research Engineer — *Apr. 2017 - Sep. 2020*

- Researched on robotic grasping, grasp assessment and control based on computer vision and tactile perception with multi-fingered hands. Leveraged deep learning models like CNNs, LSTMs, GCNs.
- Developed a real2sim pipeline to learn to simulate tactile sensation from actual grasps using GANs, and a sim2real pipeline to leverage simulated tactile responses for grasp adjustment of robotic system.
- Built a prototype to integrate novel grasping solutions in manufacturing process for an international shoe company under EU Horizon 2020.
- Published new robotic datasets and open-source algorithms in C++ (GeoGrasp) to work on real time using ROS, PCL and OpenCV.
- Coordinated a research roadmap for the laboratory related to robotic manipulation which resulted in 2 MSc thesis apart from my PhD.

Amazon Robotics AI
Berlin, Germany

Applied Science Intern — *Mar. 2020 - Aug. 2020*

- Carried out research on visual perception for detecting object manipulation defects in logistics.
- Built production library with image-based (ResNet) and video-based (i3d) learning models in PyTorch to recognise defects on real time.
- Presented the idea to senior managers and delivered a working solution to mitigate an economically impactful defect caused by manipulators.

Northeastern University
Boston, United States

Visiting Scholar — *May. 2018 - Sep. 2018*

- Designed and implemented a robotic mobile manipulation system, providing it with autonomy at grasping, navigation and task planning. Coordinated work of 2 PhD students to build the robotic platform.
- The system achieved 80.8% grasping rate, navigated without issues 96.1% of the trials, and yielded 85.7% overall task success rate.

Critical Future LTD
London, England

Computer Vision Consultant — *Mar. 2018 - May. 2018*

- Led the technical development of a ML-based solution for a health-care company to detect skin cancer from pictures of skin moles.
- Collaborated with medical experts on the design of the system and its evaluation protocol.
- Coordinated with customer's engineering team to deploy the solution built based on model ensemble.

Teralco
El Altet, Spain

Business Intelligence Engineer — *Jul. 2015 - Dec. 2016*

- Automated ETL process to load AWS Redshift database, reducing processing times from 2 days of human work to 6 computing hours.
- Collaborated with marketing staff in data analysis projects, like client segmentation, proposing solutions from a machine learning perspective.

Education

University of Alicante
Alicante, Spain

PhD in Robotics and Machine Learning — *Oct. 2016 - Sep. 2020*

- Thesis (Available here): "Robotic Manipulation based on Visual and Tactile Perception" - Graded as PhD *cum laude*.
- Proposed fast solutions that scale for robotic grasping as well as innovative methodologies for processing visual and tactile perception.
- Applied deep learning and computer vision techniques to 2D images, 3D point clouds and tactile data.

University of Alicante
Alicante, Spain

M.S. in Computer Engineering — *Oct. 2015 - Feb. 2017*

- Thesis: "Using Open Research Data for Building Recommendation Systems" - Graded with honours.
- Built an open-source tool for downloading, processing and building machine learning models from open research data in TensorFlow.
- Specialised in applied artificial intelligence for R&D in industries.

University of Alicante
Alicante, Spain

B.S. in Computer Engineering — *Sep. 2011 - Jul. 2015*

- Thesis: "Application of Swarm Intelligence for Improving a Clinical Decision Support System" - Graded with honours.
- Built a rogue-like video game for Amstrad CPC in which I implemented enemy IAs and the sound effects.
- Specialised on data mining, computer vision, robotics and artificial intelligence.

Selected Publications

Semi-supervised learning and visual transformers for product attribute extraction from e-commerce images (Link)

Impata, Brayan and Lagunas Arto, Manuel and Martinez Gomez, Victor and Fernandez Arguedas, Virginia and Georgakis, Christos and Braun, Sofia and Bertrand, Felipe (2023)

Conference on Computer Vision and Pattern Recognition (2024). Workshop on Workshop on Fine-Grained Visual Categorization

Generation of tactile data from 3D vision and target robotic grasps (Link)

Zapata-Impata, Brayan S and Gil, Pablo and Mezouar, Youcef and Torres, Fernando (2020)

IEEE Transactions on Haptics 14(1)

Tactilegcn: A graph convolutional network for predicting grasp stability with tactile sensors (Link)

Garcia-Garcia, Alberto and **Zapata-Impata, Brayan S** and Orts-Escolano, Sergio and Gil, Pablo and Garcia-Rodriguez, Jose (2019)

International Joint Conference on Neural Networks (IJCNN 2019)

Learning spatio temporal tactile features with a ConvLSTM for the direction of slip detection (Link)

Zapata-Impata, Brayan S and Gil, Pablo and Torres, Fernando (2019)

Sensors 19(3)

Autotrans: an autonomous open world transportation system (Link)

Zapata-Impata, Brayan S and Shah, Vikrant and Singh, Hanumant and Platt, Robert (2019)

International Conference on Robotics and Automation (ICRA 2019). Workshop on High Accuracy Mobile Manipulation in Challenging Environments. arXiv:1810.03400

Fast geometry-based computation of grasping points on three-dimensional point clouds (Link)

Zapata-Impata, Brayan S and Gil, Pablo and Pomares, Jorge and Torres, Fernando (2019)

International Journal of Advanced Robotic Systems 16(1)

Using geometry to detect grasping points on 3D unknown point cloud (Link)

Zapata-Impata, Brayan S and Mateo Agullo, Carlos and Gil, Pablo and Pomares, Jorge (2017)

International Conference on Informatics in Control, Automation and Robotics (ICINCO 2017). *Best Paper Award*.