Brayan **Impatá**

Researcher & Engineer

Valencia, Spain

brayan.inf@gmail.com | yayaneath.github.io | brayan-stiven-zapata-impata | Brayan Impata

Summary

As a researcher with an engineering background, I **own my projects** from problem identification, solution proposal, to deployment and monitoring. I am **passionate about learning** and I am continuously **looking for challenges**. I can organise myself effectively to **deliver results**, even out of my comfort area. This is proven by my experience on multiple application areas: robotics, healthcare and e-commerce.

Work Experience

Amazon

Madrid, Spain

Applied Scientist — *Oct. 2020 - Present*

- Work on fixing item data quality issues in the catalogue, so customers do not experience defects during shopping sessions.
- I collaborate closely with business partners to disambiguate customer problems, and SDE/MLEs to bring my solutions to production.
- My models have improved the metadata quality of +100MM products in 20 marketplaces worldwide.
- Collect data and train models such as CNN, ViT, CLIP, InstructBLIP in PyTorch and AWS SageMaker.

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.
- Delivered novel solutions that tackled robotic manipulation tasks applying deep learning models like CNNs, LSTMs, GCNs and GANs.
- Published new robotic datasets and open-source algorithms in C++ (GeoGrasp) to work on real time using ROS, PCL and OpenCV.
- Proposed 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.
- 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.
- Implemented an ensemble of models, including CNNs, Gradient Boosting Trees and SVM, which met our customer's requirements.

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

Transfer Learning for Fine-grained Classification Using Semi-supervised Learning and Visual Transformers (Link)

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

Conference on Computer Vision and Pattern Recognition (2023). Workshop on LatinX in CV. arXiv:2305.10018

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)

Tactile-driven grasp stability and slip prediction (Link)

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

Robotics 8(4)

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)

Tactile Graphs for Grasp Stability Prediction (Link)

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

International Conference on Learning Representations (ICLR 2019). Workshop on Representation Learning on Graphs and Manifolds

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)

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)

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

Non-matrix tactile sensors: How can be exploited their local connectivity for predicting grasp stability? (Link)

Zapata-Impata, Brayan S and Gil, Pablo and Torres, Fernando (2018)

International Conference on Intelligent Robot and Systems (IROS 2018). Workshop on RoboTac: New Progress in Tactile Perception and Learning in Robotics. arXiv:1809.05551

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.