



Alejandro Amat Payá

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[Github](#)

[Personal Website](#)

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Education

Carnegie Mellon University

Pittsburgh, Pennsylvania

02/2024 - 08/2024

Visiting Researcher at Carnegie Mellon's Robotics Institute pursuing my final degree thesis on the topic of real-time inverse rendering using Automatic Differentiation with Slang for Computer Vision applications. Compiling real-time in different systems such as CUDA/Direct3D/Vulkan. Under the supervision of Dr. Fernando de la Torre. Received 3 Scholarships: Erasmus+, Mobint & CFIS

CFIS, UPC (Interdisciplinary Higher Education Center from Polytechnic University of Catalonia)

Barcelona, Spain

2019-2024

CFIS is a center of excellence of the Polytechnic University of Catalonia (UPC) created to recruit, select and tutor students with sufficient capacity and motivation to pursue interdisciplinary studies that include two of the degrees that make up the UPC offer.

Bachelor's Degree in Telecommunication Technologies and Services Engineering (ETSETB)

- Major in Signal Processing
- 10 honours: Audio Processing, Data Transmission, Electronic Functions and Systems, Vectorial Calculus, Introduction to Electronics, Mobile Communications, Advanced Engineering Project, Multimedia Codification, Advanced Operating Systems & Object Oriented Programming.
- Award to the 6th best student from the 2024 class (Top 2%)

Bachelor's degree in Computer Science Engineering (FIB)

- Major in Information Technologies

Experience

VR Unity Developer

Barcelona, Spain

IESE university

12/2023-02/2024

- Working as a Freelancer for IESE developing a Virtual Reality application in Unity for mobile phones with the GoogleCardboard SDK. Creating an immersive "Gustav Klimt" museum experience while tracking position, rotation and ray casted interactions and storing the data in Google Firestore.

VR/XR Researcher. AI Driven Systems.

Barcelona, Spain

i2cat Foundation

06/2023 - 02/2024

- Developing real-time 3D Imaging algorithms using MIMO FMCW mmWave radar systems through optimal positioning of Intelligent reflective surfaces & Neural Network architectures. Optimizaton of SNR/coverage homogeneity around UE and image reconstruction.
- Working under the guidance of dr. Filip Lemic and dr. Xavier Costa, scientific director in the lab.
- Preparing to present a [paper](#) at Conference.

Big Data Analyst

Barcelona, Spain

Mango (Punto FA)

06/2022 - 09/2022

- Managing the Incoming data from various corporative sources and ingesting it into Mango's Cloud Infrastructure while developing Software with Pyspark, Dbt, MySQL and Python for the Data Layer's manipulation.
- CI/CD development with Jenkins and Automatization Processes with Airflow.
- AWS (EC2, Airflow, S3, Lambda, Sagemaker), Docker & Git.

Game Developer

Barcelona, Spain

Autonomous

2018 - now

- Developing 2D and 3D local games (PC & Mobile) with Unity Engine and C#
- 3D modelling with Blender

Projects

- Leader of a group of 12 developing a python package deployed in PyPi for Hewlett Packard (HP) to verify the construction processes with Real sense cameras. Plane segmentation and inclination detection through DBScan & RANSAC applications. Used point cloud segmentation algorithms in Python.
- Dockerized Client-Server Application focused on animal tracking. Used LoraWAN modules & gateways for socket connection and GPS. Node.js for backend including API and route/controller architecture with MongoDB database and React.js for the frontend. Created an AI module with Python-Tensorflow to predict location at a certain time. Used Docker to create containers for frontend-backend-DB-AI and Kubernetes for orchestration while using git-runner for CI/CD.
- CUDA project aimed to accelerate JPEG-DCT compression. Developed a C++ basic JPEG compression algorithm and through GPU parallelisation techniques with CUDA achieved an algorithm working 125 times faster (15000ms to 127ms). Studied different approaches such as pinned memory, shared memory, multi-gpu schemes, streams, Warp-sized blocks, Finer-to-Thicker Granularity Analysis & more.
- Neural Network & Machine Learning applications for image processing modules. Including Image segmentation, Clustering, Classification schemes, Regression, Active Contours, Morphological Operators, Unsupervised Learning Algorithms & Tensorflow implementations.
- OS kernel implementation with C and x86 to manage processes, system files, syscalls & memory. Simple but functional OS.
- Client-Server application for Subject scheduling. Possibility to check marks, Uni schedule, future work and Uni deliverables. NodeJs and MySql for Backend and Html,Css and Javascript for frontend. Java for Android app. NFC reader with Raspberry PI and RFID modules (Implemented in Ruby)
- Leader of a group developing a document manager in Java where you may store, create, receive and modify documents while using certain functions such as checking similar documents through cosine comparison, Term Frequency Inverse Document Frequency (TF-IDF) and more. Using software engineering principles such as 3 layer architecture & Junit testing.
- Complete Audio processing modules: Pitch and Sonority Detector with Autocorrelation method, Voice Estimation and Validation with GMM (Gaussian Mixture Model) and filter predictor (LP, MFCC, LPC) & Vocal Activity Detector
- IndahJoyas: Worked as a freelancer to create a responsive website with Wordpress.

Interests and areas of knowledge

- Image and Audio processing, Computer Security, Data transmission and communications, Network protocols, Electronics & Digital Systems, Operating Systems, Machine learning, Data Science, Big Data, Cloud Computing, Graphics and Visualization, Accelerators & GPUs, Parallel Computing, Data Centers, Mobile communications, Multimedia Compression & Codification, Game Development, Software Engineering, System administration, Web Development, Blockchain, 5G Wireless Imaging & Computer Architectures.

Languages & Skills

- **Spanish:** Native
- **Catalan:** Native
- **English:** Advanced (C1), 2019
- **German:** Basic

Skills:

C++	CUDA
Matlab	PHP
Python	WordPress
HTML	React
Java	Visual Studio
C	Unity
JavaScript	Arduino
C#	OpenMP
Bash	Docker
Ruby	Kubernetes
MySQL	Git
PySpark	Unix
x86	Tensorflow
OpenGL	LaTeX
CSS	Spice

Soft Skills:

Critical Thinking
Problem solving
Adaptability
Team Work
Leadership