Pedro Llanos Arroyo

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About me

I'm a Computer Science and Computer Engineering living in Barcelona. I'm interested in Artificial Intelligence Systems, Multi-Agents Systems, Fuzzy Logic, Deep Learning, Reinforcement Learning, Signals Processing - such as Image, Video, Sound, Speech, Position, Communications, Temperature, Humidity, Pressure, Touch, Lidar, Sonar, Laser -, Control Theory - such as Linear or Non-Linear PID Control Methods, Path Planning, Kalman Filter -, Dynamics Systems - such as Navier-Stokes equations -, Robotics - such as Flying, Floating, Leggeds, Wheels, Arms, Head -, Avionics, Satellites, Rockets, Space, 3D Heterogeneous Simulations with Dynamics Systems in Unreal Engine, Real-Time OS, Heterogeneous High-Performance Computing (HPC) - such as Local Cluster, Cloud Computing (Google Cloud, AWS, Azure), Edge Computing, Distributed Computing -, Decentralised or Distributed Systems - such as key-value MapReduce, Raft or Multi-Paxos consensus, Chubby, ZooKeeper, etcd3 -, Low-Power Hardware - such as MultiCore-DSP, VPU, FPGA Xilinx, Arm Neon and Mali GPU -, Design Schematic of Embedded Systems (PCB) - such as Kicad PCB Design, PCB Manufacturing -.
After a few years of preparation, the time has come. Today, I feel comfortable saying that I'm ready to implement all those ideas that I have always wanted to do. At this stage, I will continue learning, improving, and above all, maturing as a professional. I would like to continue independently, creating my projects and companies in the short and medium-term. The mission is to build safe artificial general intelligence that benefits all society to solve the world's most significant problems by collaborating with passionate people about what they do. However, I still have to grow a little more. To do that, I will collaborate with other companies with a similar philosophy, and I will looking for amazing people.

Education

2014–20 **Computer Science and Computer Engineering** at Polytechnic University of Catalonia (UPC) in Barcelona. My thesis was titled The Cooperative Negotiation and Coordination Approach in a Multi-Agent System for a Dynamic Real-Time Environment and is available through the UPC Research Archive.

2011–13 **Senior Technician in Telecommunications and Computer Systems** at IES Anna Gironella of Mundet in Barcelona.

Non-official Education (some subjects as a listener)

2019–20 **Degree in Data Science and Engineering** at Polytechnic University of Catalonia (UPC) in Barcelona.

2018–19 **Degree in Electronic Telecommunications Engineering** at Polytechnic University of Catalonia (UPC) in Barcelona.

Work Experience

2021–21 **JSNP Internship** at GNSS Academy (Join Satellite Navigation Program)

SERVUS: Service Volume User SBAS. Development of a tool for SBAS Service Performance Monitoring, Characterization and Prediction at Signal-In-Space and User level (Availability, Continuity, Accuracy and Integrity) using EGNOS/WAAS Real data campaign.

PETRUS: Position Engine Tool Receiver User SBAS. Development of the User Positioning Engine and related performances at Position level of an SBAS Mono-Frequency Receiver using EGNOS RIMS Real Data from all Stations across the ECAC.

A complete GNSS training including the following modules:

· GNSS Systems, Fundamentals and Observables
· Ranging Error Sources Definition and Models
· How to Solve for PVT Equations with estimation filters LSQ, WLSQ, KF.
· GNSS Signals Structure and Frequencies
· GNSS Receivers Architecture (Acquisition, Tracking Loops: DLL, PLL)
· Introduction to Precise Orbit Determination (POD) for GNSS Orbits
· Ionosphere in GNSS: Impact, disturbances, mitigation and estimation
· SBAS fundamentals and Corrections Content (MOPS DO-229D/E)
· EGNOS System, Architecture, Services, Applications, Performances
· CPF algorithms EGNOS V2/V3 (CPV/COBS, ODP, IONO, CLK, UDRE/OOCRE)
· Galileo System, Architecture and Services (OS, SAR, HAS, CAS, PRS)
· Galileo GMS Elements, and Ranging Accuracy Performances
· GNSS Tools for EGNOS Performance Qualification
· Differential Positioning Systems DGNSS/DGPS/SBAS
· Precise Positioning: PPP/RTK (Carrier Phase Ambiguities fix resolution)
· ARAIM: Advanced Receiver Autonomous Integrity Monitoring for Aviation.
· IGS Reference Products Standard formats (RINEX, SP3, CLK, IONEX, ATX, DCB...)
· GNSS Market and Current Initiatives/Programmes

2016–18 **Systems Administrator** (UPC Intern Support) at Department of ETSEIB Mathematics in Barcelona.

Languages

Spanish | Catalan (Native)
English (Intermediate to First)
2015–16 Certificate of Completion English Course - **First** (60h) at ChapterHouse Dublin in Ireland.
2012–13 Certificate of Completion English Course - **Pre-Intermediate** (60h) at CCD Central College Dublin in Ireland.

Honors-Awards

JUL 2021 **PUMPS+AI Summer School 2021 @BSC**

Objectives:

The eleventh edition of the Programming and Tuning Massively Parallel Systems + Artificial Intelligence summer school (PUMPS+AI) is aimed at enriching the skills of researchers, graduate students, and teachers with cutting-edge techniques and hands-on experience in developing applications for many-core processors with massively parallel computing resources like GPU accelerators.

Organized by:

· Barcelona Supercomputing Center (BSC)
· University of Illinois at Urbana-Champaign (University of Illinois)
· Universitat Politècnica de Catalunya (UPC)
· HiPEAC Network of Excellence (HiPEAC)
· PUMPS is part of this year PRACE Advanced Training Centre program

The following is a list of some of the topics that will be covered during the course:

· Deep Learning
· High-level programming models (OpenACC, Python, and Mathematica on GPUs)
· CUDA Algorithmic Optimization Strategies
· Dealing with Sparse and Dynamic data
· Efficiency in Large Data Traversal
· Reducing Output Interference
· Controlling Load Imbalance and Divergence
· Acceleration of Collective Operations
· Dynamic Parallelism and HyperQ
· Debugging and Profiling CUDA Code

· Multi-GPU Execution
· Architecture Trends and Implications
· Introduction to OmpSs and to the Paraver analysis tool
· OmpSs: Leveraging GPU/CUDA Programming
· Hands-on Labs: CUDA Optimizations on Scientific Codes; OmpSs Programming and Tuning

Instructors:

· Distinguished Lecturers: Wen-mei Hwu (University of Illinois at Urbana-Champaign / NVIDIA)
· Invited Lecturer: Juan Gómez-Luna (ETH Zurich)
· BSC / UPC Lecturers: Antonio J. Peña, Xavier Martorell and Xavier Teruel
· Teaching Assistants: UIUC (Carl Pearson, Mert Hidayetoglu) and BSC/UPC (Marc Jorda, Simon Garcia de Gonzalo)

MAR 2020 **Heterogeneous Programming on FPGAs with OmpSs@FPGA @BSC**

Objectives:

This tutorial will introduce the audience to the BSC tools for heterogenous programming on FPGA devices. It describes OmpSs@FPGA, as a productive programming environment for compute systems with FPGAs.

More specifically, the tutorial will:

· Introduce the OmpSs@FPGA programming model, how to write, compile and execute applications on FPGAs
· Show the “implements” feature to explot parallelism across cores and IP cores
· Demonstrate how to analyze applications to determine which portions can be executed on FPGAs, and use OmpSs@FPGA to parallelize/optimize them.

Learning Outcomes:

The students who finish this course will be able to develop benchmarks and applications with the OmpSs@FPGA programming model to be executed in FPGA boards, like Zedboard or Xilinx ZCU102 with Vivado HLS Xilinx.

Instructors:

· Xavier Martorell and Daniel Jimenez.

Areas of expertise

Advanced Data Structure
Advanced Algorithmics
Deep Learning
Machine Learning
Reinforcement Learning
Signals Processing
Multi-Agents Systems
Distributed Systems
Advanced Robotics
Heterogeneous High-Performance Computing
Low-Power Embedded Systems
Real Time Systems
Code Profiling, Tracing and Bit Hacks
Parser and Generator of ANTLR4 Grammars

General skills

LaTeX
GitHub / GitLab / Bitbucket
UNIX / Windows OS

Technical skills

	Computer Science	Computer Engineering	Software Engineering	Audiovisual Production
Programming languages	C, C++, Python, R, Haskell, Matlab	OpenMP, OmpSs-2, PyCOMPSs, OpenACC, OpenBlas, MPI, OpenCL, CUDA, PYNQ, Vivado HLS Xilinx, VHDL, MIPS Assembly, VLIW Assembly, ARM Assembly (RISC), x86 Assembly (CISC), RISC-V Assembly	Java, C#, PHP, Ruby, HTML5, Jade, CSS3, Javascript, Typescript, Sass, JSON, XML, AJAX, Swift, MySQL, PostgreSQL, MongoDB, SQLite, Firebase Realtime Database, Gruntjs, Bower.io, Yeoman.io	-
Machine and Deep Learning Frameworks	OpenCV, Scikit-learn, Keras, TensorFlow, Torch, PyTorch, Theano, Caffe, DL4J, MXNet, ONNX, OpenNN, CNTK, Spark, Apache	-	CVAT, Label Studio, LabelBox	-
General Frameworks	-	Google Cloud, AWS, Azure, Docker, Kubernete, Vagrant, VMWare, VirtualBox, PCB Design Kicad	Android Studio, Xcode(iOS), Grafana, Prometheus, Nmap, Wireshark, MetaSploit	Adobe Premier Pro, Adobe After Effects, Adobe Photoshop, Inkscape, Adobe Audition, Cinema 4D, 3ds Max, Maya, AutoCAD, Revit, SketchUp, Inventor, SolidWorks
Frontend Frameworks	-	-	React, Next.js, Redux, GraphQL, React Native, Vue, Angular, jQuery, Ionic	-
Backend Frameworks	-	-	Node.js, Express.js, Flask, FastAPI, Firebase CRUD	-
Games Engines	OpenGL, WebGL, GLSL, PhysX	-	Qt, Blender, ZBrush, Unity, Unreal Engine, Twinmotion, CryEngine	-