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Juan Casado Ballesteros

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Born September 6, 1998.

Education

Alcalá de Henares, Madrid	Universidad de Alcalá de Henares	2016 – 2020

- Bachelor's degree in **Computer Science**, GPA de 3.32/4 (8.30/10).
- A total of 6 Honor Registrations obtained.
- **Coursework**: Statistics, Linear Algebra, Calculus, Logic, Algorithmics and Complexity, Data Structures, Operative Systems, Data Bases, Distributed Systems, Robotics, Artificial Vision, Functional Programming, Software Engineering, Physics, Communication Networks, Artificial Intelligence, Compilers, Object Oriented Programming, Logical Programming, Cloud Systems, GPU Programming, Testing, Quality and Software Maintenance.

Alcalá de Henares, Madrid	Brithis Council	2016 – 2018

During the first three years of my degree I attended English classes, the first year they were oriented to a B2 level of English and the last two years they were oriented to a C1 level.

- **Cambridge CAE C1**, TOEFL 110-114 level English classes.

Employment

Alcalá de Henares, Madrid	Complubot	2016 – 2019

During the first three years of my career I worked at a local company that teaches robotics. I was in charge of developing robots that could be used in demonstration, competitions, fairs and conferences.
As a part of the developer team I designed the software architecture of the robots, programmed their planning and control algorithms as well as mobile and desktop applications to control them. Some mainstream frameworks and libraries in the robotics and artificial vision fields like ROS, Arduino and OpenCV where used.

- Autonomous ROS based robot capable of localize itself on a map, create maps of the environment and follow people. Programed with Python and C++. Once localized on the environment, the robot can identify a person by its face and follow him though a crowded environment while avoiding obstacles.
  - With this robot we tried to participate on the Robocup at Home 2019 but were not accepted.

- Semi-teleoperated Arduino based robot that mimics the educative robot TrueTrue being eight times bigger than the original. The robot implements a state machine that reads colored cards that encode the actions that the robot should perform. Additionally, the robot can be fully teleoperated from a multi-platform, mobile and desktop C++ application available to download on the App Store and Google Play Store.
  - This robot was presented at the SIMO fair in IFEMA, Madrid on November 2018.

- Couple of autonomous robots that coordinates through Bluetooth to play robot soccer. Both robots have a modular two layered software architecture programmed on C++. The first layer is in charge of reading the robot sensors and controlling the robot actuators which include an electronic compass, a 360º infrared detector and four motors with encoders. The second layer takes decisions and coordinates both robots using diffuse logic.
  - These robots where third among of eight European teams on the Imperdibles 2.0 competition on 2017.

Investigation

Alcalá de Henares, Madrid	Universidad de Alcalá de Henares	2018 – 2020

During the last two years of my degree I worked together with one of the research groups of the Computer Science department on multiple projects related to the calculation of antenna propagation and optimization of its positioning with genetic algorithms. During this time, I participated in four articles and a book.

- **Application of bioinspired algorithms for the optimization of a radio-propagation system simulator based on OpenStreetMap** Juan Casado, José Luis González, Abdelhamid Tayebi, Josefa Gómez, Francisco Sáez de Adana ACCSE 2019: The fourth International Conference on Advances in Computation Communications and Services. July 28, 2019/August 02, 2019 at Nice, France. ISBN: 978-1-61208-735-1 pages 8-11.
- **Development of Competence Maps for Training Programs Based on the European Frameworks e-CF and ESCO** Josefa Gómez, Luis Fernández, Ana Castillo, Juan Casado, Abdelhamid Tayebi. ACCSE 2019: The fourth International Conference on Advances in Computation Communications and Services. July 28, 2019/August 02, 2019 at Nice, France. ISBN: 978-1-61208-735-1 pages 12-15.
- **Extraction and Use of Geometry Data to Obtain 3D Buildings on a Web Map.** Juan Casado, Josefa Gómez, Abdelhamid Tayebi. ACCSE 2020: The Fifth International Conference on Advances in Computation, Communications and Services. *(To be published on summer 2020)*
- **On the Use of Websockets to Maintain Temporal States in Stateless Applications.** Juan Casado, Josefa Gómez, Abdelhamid Tayebi. ICIW 2020: The Fifteenth International Conference on Internet and Web Applications and Services. *(To be published on summer 2020)*
- **Applications of Geographic Information Systems for Wireless Network Planning** Francisco Sáez De Adana, Josefa Gómez Pérez, Abdelhamid Tayebi, Juan Casado Ballesteros. Artech House. ISBN: 9781630817633.

Personal projects

Parallel to university and work, I have created various libraries and applications using novel technologies that are of interest to me. All these projects are published on GitHub as open source.

- Distributed multi-node Hadoop installation using Docker Swarm. It was used to analyze data recollected from Twitter API using Flume. The recollected data is stored on HDFS, processed with Pig and saved on Hbase following the lambda architecture. The data is then accessed with Hive and analyzed with Knime and RapidMiner.
- Real time person tracker implemented with Python using OpenCV, Yolov3. It recognizes features of a single face and distinguish it from other faces on the picture using a Kalman filter.
- Graphic simulator of ten different sorting algorithms. The simulator has a React web front end and a Type Script back end that communicate through Websockets or REST depending on the user configuration.
- State space search library developed on C++ with common algorithms like A*, breadth first and depth first search.
- ColorQueue and GameOfLife: multi-platform iOS, Android and desktop implemented with C++ using cocos-2d.
- JAVA program that translates JSON to DOT and DOT to SVG files with a Parser and a Lexer using antlr4 library.
- Imitations of the 2048 game implemented one with CUDA and another with Scala including an auto-play mode.
- Set of common algorithms implemented on Swift: greedy, recursive backtracking and dynamic.
- Shutter Earth: shooter and platform 2D game developed on JAVA with the game engine slik2d.

Positions as student representative   2018 – 2020

- Member of the School Board.
- Member of the Student Council.
- Member of the Governing Council of the University of Alcalá de Henares.

Technical experience

- **Programming languages**: C++, C, JAVA, Python, NodeJS, R, Matlab, Scala, Swift, SQL, CUDA, Ocaml, Lisp, Prolog.
- **Deployment and virtualization**: Docker, Docker Swarm, Docker Machine, Kubernetes.
- **Front-end web**: React, P5, Leaflet, Open Layers, TypeScript, JavaScript, HTML, CSS, WordPress.
- **Robotics, planning and artificial vision**: ROS, Arduino, PDDL, Optic, SGplan, OpenCV.
- **Databases**: PostgreSQL, MongoDB, Firebase, Neo4j, MySQL.
- **Hadoop**: Hbase, Hive, Pig, Flume, HDFS, Mapreduce.
- **Data analysis platforms**: Knime, RapidMiner.
- **Compilers and language design**: antlr4.
- **Project management**: JIRA, Slack, MS Project, Gantt Project.
- **Documentation**: Modelio, Rational, Markdown, LaTeX.
- **Version control**: Git, GitHub.
- **Network sniffing**: Wireshark.
- **Operative systems**: Linux, macOS.
- **Graphic libraries and game engines**: cocos2d-x, pygame, slick2d, JAVA-Swing, graphviz.
- **IDEs**: Visual Code, NetBeans, XCode, Emacs, Vim, CLion, PyCharm, Code Blocks, Code Lite, Android Studio.

Other Information

- Have participated on the first and the second Hackathons held at the Alcalá de Henares University on 2018 and 2019 respectively.
- Active participation on online math puzzles and challenges like the ones that the company Jane Street monthly posts.