

## PERSONAL INFORMATION



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Sex Male | Birthday November 5th, 1989 | Nationality Spanish

## PROFESSIONAL EXPERIENCE

### Current CTO & CoFounder.

*Ready For Change S.L. - Refixme.com*

My role in Refixme ranges from full stack development, server maintenance, preparation and research of Artificial Intelligence models such as Natural Language Processing and Computer Vision or data analysis, to relationship with techie partners and bring the technological vision in the company. On the other hand, I am also focused on raising investment for the company and making the small changes necessary to generate greater scalability.

I have developed a backoffice for managing orders, partners, services, customers, repaired articles, and invoicing related with providers.

The orders come from a WooCommerce installation on the main domain. That data seeds the backoffice. The database is designed in PostgreSQL. Backend API written in Node.js, and the administration UI was developed using React and Bootstrap mainly.

Everything is deployed into Amazon AWS: RDS, ElasticBeanstalk and S3.

Oct 2018 - Oct 2019

### Project Management. Software development. Machine Learning Research.

*Quatechnion S.L. UPV. València, Spain*

- Research and development on advanced state of the art techniques to track people from body, skeleton, facial coding, emotion recognition, age/gender estimation and other features applied to retail.
- Technical maintenance and process automation for several deployed systems at big supermarkets. Problem solving and contact with clients.
- Decision making of structure, ventilation, hardware requirements on "smart" furniture: SmartShelf©.
- Project management. Transitioning the company to agile methodologies. Teaching the team how to use task boards and control version (GIT). Task planning and task assignation.
- Development of software: creating APIs using Python, designing all required databases, prototyping "demo players" using React and implementing Augmented Reality modules. Realtime data flow management using MQTT protocol. Interaction with physical products by using Computer Vision algorithms and RFID detection.

**The main product in the company is furniture with sensors and screens on them. My main role is the development of machine learning and computer vision algorithms to track consumer's behaviour in front of the shelves, but also, I developed the backend API of the systems where we can select which products are being featured on the screens and manage all the media files about them. I managed and taught the three developers in the team to accomplish all needed tasks on software development by adopting agile methodologies.**

Apr 2018 - Oct 2019 **Software development. Web development. Mobile Apps development.**  
*Freelance. València, Spain*

**I worked on some different projects related to web technologies and smartphone targeted apps.**

Dec 2016 – Apr 2018 **.Net Backend developer.**  
*Grupo Romeu Multiservices. València, Spain*

- Development of different features in the backend of an MVC application in .NET
- Creation, update and optimization of queries for SQL Server, mixing data from Spain and Mexico Servers.
- Automation of data collection from different sources, unification of structure, data cleaning and storage, saving more than 2.000€ monthly in third party APIs.
- Development of system services for scheduled execution of tasks.
- Creation of a Rest API for querying, modification, creation and deletion of different objects related to port logistics and its related documentation management.
- Creation of a Chatbot that allows customers to check the status of their orders.
- Implementation of a customer order data quality assessment metric. It allows managers to track which orders are having issues.
- Development of several data management tools from MS Outlook (add-in) using Rest API. (Tracking orders from subject email. Check CRM data. Update database.)
- Prediction of best maritime routes from Port to Port. Also, mixed data from prediction and current GPS tracking to show the tracking map.

**We worked based on SCRUM, analysing, estimating and carrying out the established tasks.**

Jul 2014 – Oct 2016 **Software developer and researcher.**  
*Research Group LSyM - IRTIC. Universitat de València, Spain*

- Development of hardware and software systems for graphics environments and interactive simulation.
- Addition of virtual characters into simulation scenarios using OpenSceneGraph and Cal3D library.
- Development and debugging of simulation scenarios used for teaching workers.
- Modeling multibody-systems and vehicle physics for heavy machinery.
- Setting up the new website based in wordpress.
- Implementing behavioural models for virtual agents and crowds of virtual agents.
- Operational research applied to harbour environment.

**I worked in 7 different simulation scenarios (from harbour to minery) and presented PositionBasedBoids at CEIG (Spanish Computer Graphics Conference) as a research work in progress (2015).**

Jan 2014–Aug 2014 **Trainee Student**  
*Museum of Geology and Paleontology of the Universitat de València, Spain*

- Development of a web application using MVC architecture, allowing to manage all the information of more than 18.000 pieces that they keep in the museum with a different CRUD level permission system.
- Design and development of the Database in SQL.
- Implementation of a WebGL viewer for displaying the pieces scanned with a 3D scanner.
- Collaboration on specific museum educational and outreach activities.

**That was mainly my Degree's Final Project, getting 9.43 over 10 as final grade. Also we presented it at a Paleontology Conference as an application of how to manage museum data in virtual workgroups.**

- May 2012–Jan 2013 **Web applications developer**  
*Advertising Agency. Doble Vía, CC. Valencia, Spain*  
Creating, maintaining and implementing the source code for the clients websites.
- Apr 2011–Nov 2011 **Web applications developer**  
*Advertising Agency. Buenos Días, Lorenzo. Valencia, Spain*  
Creating, maintaining and implementing the source code for the clients websites.

## ACADEMIC FORMATION

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- 2016–2018 **Master's Degree in Artificial Intelligence, Pattern Recognition and Digital Imaging**  
Universidad Politécnica de València, Valencia (España)
- Pattern recognition techniques, machine learning, natural language processing, computer vision, biometrics, image processing and computer graphics, among others.
- Final Master's Degree project pending.**
- 2010–2015 **Bachelor's degree in Multimedia Engineering**  
Universitat de València, Valencia (España)
- Programming, computer graphics, animation, simulation, GPU programming, Software Engineering, Project Management, web technologies, databases, UX, among others.

## GROUP PROJECTS

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- April 2018 **PterosaVR - Cretaceous Flying Giant back to life**  
*MUVHN - Museu de la Universitat de València d'Història Natural. VR-AR mobile app*
- Paleoart has been combined with new technologies to develop a mobile application that allows, through a Virtual Reality helmet, to assist in the reconstruction of the pterosaur, walking through the skeleton, muscles and external appearance.
  - We presented this project at IIEP 2018 (Paleoartistic Conference, Madrid, Spain) as a result of a full study about this specimen.
  - We presented this project at CEIG 2018 (Spanish Computer Graphics Conference, Madrid, Spain) showcasing the process from the paleoartistic study to a finished application.
  - We presented this project at Flugsaurier 2018 (Symposium specialized in pterosaurs, Los Angeles, USA) as a useful application to many museums in the world exhibiting pterosaurs.
- April 2015 **Running Mars. Educational Game developer**  
*48 hours hackathon SpaceApps challenge by NASA.*
- We presented an educational game prototype to teach people about space, Mars, lava tubes, how to survive under Mars condition and also helping SETI project to compute data while you are playing the game.
  - Developed a procedural lava tubes scenario generator.
  - Made with Unity to easily deploy it to Android and iOS devices for the presentation.

Jan 2013–Nov 2014

### The ST<sup>2</sup>OOL project. Advisor of research students

*iGEM Team Valencia Biocampus. [2014.igem.org/Team:Valencia\\_Biocampus/](http://2014.igem.org/Team:Valencia_Biocampus/)*

- Participant in the Synthetic Biology competition iGEM as advisor in the Valencia Biocampus team.
- Advising and helping research students in the ST<sup>2</sup>OOL project (Standardization, Stability, Orthogonality and Open License) for the iGEM contest at the MIT.
- Implementing the main wiki structure and designing it to attract the attention of the judges.
- Teaching students to use web tools.
- Adapting interactive tools into the wiki page: Generate a promoter sequence and compute the ST<sup>2</sup> index for a given expression rate online.

**We presented our project in Boston, MA, and we received excellent reviews of our work and a mention for our great wiki.**

Sept 2012–Nov 2013

### Wormboys. Research student

*iGEM Team Valencia Biocampus. [2013.igem.org/Team:Valencia\\_Biocampus/](http://2013.igem.org/Team:Valencia_Biocampus/)*

- Participant in the Synthetic Biology competition iGEM as student researcher in the Valencia Biocampus team.
- Involved in the modeling of the behavior of C.elegans produced by E.coli and P.putida bacteria. Mixing random walk with group behavior.
- Development of the online interactive simulator of the modeled behavior.
- Implementing the main wiki structure and designing it to attract the attention of the judges, using interactive animations that explain all the project in a few clicks.

**In Lyon (France) we presented our project for the European Regional Jamboree and we obtained a Gold medal and advanced to the World Championship in the MIT (Cambridge, MA), where we won the prize for the best new application (Synthetic Biology).**

**We also published a paper in ACS Synthetic Biology.**

## EXPERIENCE AND SKILLS

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### Experience

Experience in Python, Javascript, Nodejs, C++, C#, GLSL, PHP, Java, Matlab, among others.

Fullstack experience in web and desktop technologies. I work on Linux, MacOS and Windows.

Expertise in Computer Graphics, Computer Vision, Augmented Reality and Virtual Reality.

Experience working in multidisciplinary projects, in real production environments, coordinating people, etc.

Expertise in Artificial Intelligence algorithms, supervised and unsupervised machine learning techniques, clustering, etc.

Experience in simulation of dynamics as fluids with SPH or Waveparticles, rigidbodies, cable simulation, spring-mass, FEM, softbodies with PBD.

Experience in behavior simulation and pathfinding, like Flocking, Random Walk, Ant Colony Optimization, A star, etc.

Related personal projects:

- An online image processing app to show the process of filtering an image, showing the image, its integral image, its histogram and CDF. Implements several filters grayscale, invert, histogram equalization, local normalization, user configurable convolutions and some predefined as Gaussian blur, sharpen, or sobel filter, a Retinex implementation callable from browser console to configure it. I used this library also to create an application to reveal center and deltas from a fingerprint scanned image.

### Software libraries

Experience in Machine and Deep Learning Frameworks as Keras, Tensorflow, Caffe, PyTorch, or Scikitlearn among others.

Experience in Graphics Libraries as OpenGL, WebGL, OpenSceneGraph (OSG).

Experience in the Physics Library NVIDIA PhysX and FLEX.

Experience with the Microsoft Kinect SDK for graphics apps development.

Experience in lot of graphic Javascript Libraries as three.js, d3.js or raphael.js.

Experience in most popular javascript frameworks like React, Angular or Vue.

### Development frameworks

Strong experience in the development of applications using Processing and Unity 3D.

Basic knowledge of Unreal Engine 4.

Experience using Microsoft Visual Studio IDE.

### Video and image editing tools

Strong experience in Adobe Photoshop and familiar with Adobe Illustrator.

Experience in Adobe Premiere / Sony Vegas and Adobe After Effects.

### **PterosaVR MUVHN, an application for the virtual reconstruction of Tropeognathus mesembrinus.**

(Short-paper) CEIG - Spanish Computer Graphics Conference (Madrid, 2018)

(Full Paper) Flugsaurier 2018 (Symposium specialized in pterosaurs, Los Angeles, USA)

Both paleoart and new technologies are very useful and visually attractive tools for the representation of extinct life. In this project, both disciplines have been combined in the development of a mobile application that allows, through the use of a virtual reality helmet, to assist in the reconstruction of the pterosaur Tropeognathus mesembrinus, walking through three anatomical levels: the skeleton, the musculature and the external aspect. The reconstruction culminates with a scene of Tropeognathus flying over a Lower Cretaceous landscape. In addition, it includes a 3D viewer through which the pterosaur's anatomy can be navigated, as well as an option to display it in augmented reality when finding the museum's logo. In conclusion, this application is a new and attractive way of presenting a paleontological piece to the general public, who will be able to familiarize themselves not only with Tropeognathus and pterosaurs, but also with the process of rebuilding extinct life.

It is as a useful application to many museums in the world exhibiting pterosaurs.

<http://tonnyesp.com/publications/CEIG2018.pdf>

### **Creation and Management of a common database as a tool in a Virtual Working Group: e.g. Database of Spanish Devonian events.** (Poster) Paleontology Conference (Baeza, Spain, 2015)

It is a relational database with a complete structure to store all the information about the pieces they study. The design system is modular, so that information fields can be easily added according to new needs. In addition, different methods are offered for the simple filtering of the lists of items using criteria chosen by the researchers.

On the other hand, this system allows the visualization of the associated images as a gallery and, if the part has the resource, the 3D visualization in an interactive viewer.

The fields included in the DB have been defined according to the information they contain (taxonomic, stratigraphic, PDF files, etc.), making it possible to create new fields if necessary.

<http://tonnyesp.com/publications/SEP2015.pdf>

### **PositionBasedBoids, a constraint based flocking behaviour** (Poster) CEIG - Spanish Computer Graphics Conference (Benicàssim, 2015)

Dynamics of flocking behaviours has a long history in computer graphics. In the last years, the class of position-based (PBD) methods has become popular, specially in interactive environments. This work shows a new approach to model flocking behaviours based on PBD. Following the boids model, we address cohesion, alignment and separation, and we compare our results with the classical boids model.

<http://tonnyesp.com/publications/CEIG2015.pdf>

### **Simulating atmospheric effects using Perlin noise.** (Poster) CEIG - Spanish Computer Graphics Conference (Zaragoza, 2014)

The main use of Perlin noise is procedural texture generation. However, it can be used as a source of noise for scalar or vector fields and, in particular, for velocity fields. In this work we present a model and a test application to simplify the task of simulating atmospheric effects using a vector field modified by Perlin Noise.

<http://tonnyesp.com/publications/CEIG2014.pdf>

**Engineering Bacteria to Form a Biofilm and Induce Clumping in *Caenorhabditis elegans*.** ACS Synthetic Biology. February 2014

Bacteria are needed for a vast range of biotechnological processes, which they carry out either as pure cultures or in association with other bacteria and/or fungi. The potential of bacteria as biofactories is hampered, though, by their limited mobility in solid or semisolid media such as agricultural or domestic waste. This work represents an attempt toward overcoming this limitation by associating bacterial biotechnological properties with the transport ability of the nematode *Caenorhabditis elegans*. We report here biofilm formation on *C. elegans* by engineered *Escherichia coli* expressing a *Xenorhabdus nematophila* adhesion operon and induction of nematode social feeding behavior (clumping) through an *E. coli*-mediated iRNA blocking on the expression of FLP-21, a neuropeptide involved in worm solitary behavior.

<http://tonnyesp.com/publications/iGEM2014.pdf>