Marc Benedí

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Education

Technische Universität München   *Munich, DE*

M.Sc., INFORMATICS   *October 2019 - September 2022*

- Specialised in Computer Vision and Deep Learning
- Thesis topic: Learning Robust Correspondences for Relative Estimation

University of Edinburgh   *Edinburgh, UK*

ERASMUS+   *January 2018 - May 2018*

- Cursed Artificial Intelligence and Software Engineering courses

Universitat Politècnica de Catalunya, Barcelona Tech   *Barcelona, ES*

B.Sc., COMPUTER ENGINEERING   *September 2014 - July 2018*

- Specialised in Computer Science
- Thesis topic: Design of an environment for solving pseudo-Boolean optimization problems

Experience

Visual Computing Laboratory - Technische Universität München   *Munich, DE*

RESEARCH FELLOWSHIP   *May 2021 - April 2022*

- Designed a Convolutional Deep Neural Network to estimate correspondences and perform robust optimization to reconstruct 3D rigid-motions
- Fellowship awarded to outstanding Master students to allow them developing state-of-the-art models

Visual Computing Laboratory - Technische Universität München   *Munich, DE*

WORKING STUDENT   *April 2020 - Present*

- Built a high-performance computing cluster for the "Visual Computing & Artificial Intelligence" laboratory using Slurm Workload Manager
- Designed a frontend with Vue.js and a backend for the cluster's users
- Set up and maintain the systems using different technologies such as LDAP, NFS, PXE, ...

Helm Mobile   *Barcelona, ES*

SOFTWARE ENGINEER   *September 2018 - September 2019*

- Developed Android applications using Kotlin, Dagger, Clean Architecture, and Retrofit
- Developed backends using Kotlin and SQL
- Developed a client using vue.js and javascript

European Organization for Nuclear Research   *Geneva, CH*

INTERNSHIP   *June 2019 - September 2018*

- Engineered a cluster for the BE-OP-LHC team at CERN using Kubernetes
- Improved the BE-OP-LHC team systems' scalability, availability and response time a 118%

Universitat Politècnica de Catalunya, Barcelona Tech   *Barcelona, ES*

RESEARCH FELLOWSHIP   *September 2017 - July 2018*

- Derived a new conversion of Binary Decision Trees to Conjunctive Normal Forms

Ernst & Young   *Barcelona, ES*

INTERNSHIP   *June 2017 - September 2017*

- Developed a front-end client using HTML, CSS, JS, jQuery
- Developed a back-end using Java

JEDI   *Barcelona, ES*

ANDROID TEACHER   *Winter/Summer 2017*

- Taught an introduction to Android development course to 25+ students

Projects

Learning Correspondences for Relative Pose Estimation

TECHNICAL UNIVERSITY OF MUNICH   *2021*

- Designed and implemented a method for end-to-end learnable, differentiable relative pose registration of RGB-D frames.The method predicts correspondences using heatmaps which then are feed into a differentiable weighted Procrustes to estimate the final transformation between the frames.
  PyTorch, C++

KinectFusion

TECHNICAL UNIVERSITY OF MUNICH   *2021*

- Implemented "KinectFusion: Real-Time Dense Surface Mapping and Tracking" for real-time reconstruction of large-scale indoor scenes from RGB-D frame.
  CUDA, C++, CMake, Eigen, Ceres Solver

SLAM for autonomous vehicles

WARP   *2020*

- Implemented SLAM for an autonomous vehicle using odometry of the sensors and the point cloud generated from the LIDAR.
  C++, PCL, ROS, Ceres Solver, Google Cartographer

Divergence-Free Shape Correspondence with Time Dependent Vector Fields

TECHNICAL UNIVERSITY OF MUNICH   *2020*

- Extended the paper "Divergence-Free Shape Correspondence by Deformation" to represent sequences of non-rigid deformations as a time dependent vector field.
  PyTorch

Awards

Distinctions

- **Universitat Politècnica de Catalunya, Barcelona Tech** - Computer Security (2017), Software Architecture (2017), Operative Systems (2015)
- **University of Edinburgh** - Reasoning Agents (2018), Software Testing (2018)

Hackathons

- **HackUPC**, Barcelona 2017 - GFI Sponsor prize
- **FoodHacks**, Berlin 2016 - First prize, Lidl Sponsor prize
- **Stirhack**, Stirling 2016 - First prize

Additional Information

Languages

- English - C1
- Spanish - Native
- Catalan - Native
- German - A1

Programming Languages and Frameworks	Python, PyTorch, Kotlin, Java, C++, Javascript
Git	Experienced with branches, rebasing, conflicts, release workflow, etc
Android Studio	Familiar with development, testing and debugging
Systems	Self-hosted e-mail server, websites, APIs and VPN
Leadership	Head of formation at Jedi UPC, a university teaching non-profit and Vice-president at FECJE
Teaching	Taught various courses at Jedi UPC and some workshops
Teamwork	Developed multiple production quality projects for third parties