EDGAR RIBA

Education

UNIVERSITAT AUTONOMA DE BARCELONA — Barcelona, Spain
10/2015–now (finishing November 2020)
Ph.D. in Computer Science
Dissertation: *Geometric Computer Vision Techniques for Scene Reconstruction.*
Advisor: Daniel Ponsa.
Research Topics: Deep Learning, Local Features, Camera Pose and depth estimation.

UNIVERSITAT POLITECNICA DE CATALUNYA — Barcelona, Spain
07/2012–06/2015
M.S. in Automatic Control and Robotics.
Dissertation: *Implementation of a 3D pose estimation algorithm.*
Advisors: Adrian Penate and Francesc Moreno-Noguer.

UNIVERSITAT POLITECNICA DE CATALUNYA — Barcelona, Spain
07/2008–06/2012
B.S. in Geomatic and Surveying Engineering.

Work Experience

OPENCV.ORG
04/2018–now
Member of the steering technical committee at OpenCV.org

- representing the OpenCV library in public events to advertise the Open Computer Vision framework.
- leading the Kornia project within the org.
- organizing and mentoring collaboration projects (e.g. during Google Summer of Code).

INSTITUT DE ROBOTICA I INFORMATICA INDUSTRIAL (CSIC-UPC) — Barcelona, Spain.
11/2019-now
Research Scientist

- working on geometric computer vision for deformable objects.

Kognia Sports Intelligence — Barcelona, Spain.
11/2019–03/2020
Computer Vision Advisor

- support to the computer vision team.

Kognia Sports Intelligence — Barcelona, Spain.
08/2019–10/2019
Computer Vision Research Engineer

- working on camera calibration.

Imperial College London — London, United Kingdom.
06/2018–11/2018
Visiting PhD Student

- Research stay at the Intelligent Systems and Networks group with Dr. Krystian Mikolajczyk.

- Worked on local features detection combining deep nets and classical methods.

ARRAIY, Inc. Barcelona, Spain.
11/2017–06/2019

PhD candidate and Research Engineering Intern

- leading the Open Source team of the company.
- maintainance and development of the Kornia open source project.
- remotely working on research for depth estimation with deep nets and 3D geometric computer vision for VFX content generation.

ARRAIY, Inc. Palo Alto, CA, USA.
05/2017–10/2017

Research Engineering Intern, Geometry group

- developed and integrated an internal framework for differential 3D geometry using deep nets.

COMPUTER VISION CENTER Barcelona, Spain
10/2015–05/2017

PhD candidate, MultiSpectral Image Analysis and Understanding group

- worked on deep learning applied to local features.
- holder of the trainee research staff grant in the CS department at the Universitat Autonoma de Barcelona.

OPENCV online
05/2016–08/2016

Intern, Google Summer of Code

- integrated tiny-dnn to OpenCV contrib by adding a wrapper to the caffe converter.
- fixed bugs in tiny-dnn and developed several new features such as GPU support via OpenCL and NNPACK optimizations.

OPENCV online
05/2015–08/2015

Intern, Google Summer of Code

- developed the Structure From Motion module using a customized version of Libmv.

ALDEBARAN ROBOTICS Paris, France
02/2015–06/2015

Intern Software Engineer, Perception team

- designed and implemented an algorithm for people detection and tracking by sensor fusion using ROS, OpenCV and C++.

OPENCV online
05/2014–08/2014

Intern, Google Summer of Code

- designed and implemented a real time pose estimation algorithm for textured objects.
- implemented the PnP method: *A direct least-squares* (DLS) in the calib3d module.
- contributed with a tutorial for the calib3d module.

INSTITUT DE ROBOTICA I INFORMATICA INDUSTRIAL (CSIC-UPC)
Barcelona, Spain
05/2014–08/2014

Research Assistant, Perception and Manipulation group

- worked on my masters thesis in geometric computer vision.

Teaching Experience

UNIVERSITAT AUTONOMA DE BARCELONA Barcelona, Spain
102708, *Software Engineering Fundamentals*, Spring 2018: Associate Professor

UNIVERSITAT AUTONOMA DE BARCELONA Barcelona, Spain
102708, *Software Engineering Fundamentals*, Spring 2017: Teaching Assistant

UNIVERSITAT POLITECNICA DE CATALUNYA Barcelona, Spain
310209, *Electromagnetism and Optics*, Fall 2007: Teaching Assistant
310209, *Electromagnetism and Optics*, Spring 2007: Teaching Assistant

Professional Activities

Member of the steering technical committee at OpenCV.org.

Mentor of Google Summer of Code mentor in OpenCV since 2018.

Student of Google Summer of Code mentor in OpenCV from 2014 to 2017.

Creator of the Open Source Diffrentiable Computer Vision Library www.kornia.org. Maintance and development since 2017.

Mantainer/developer of the tiny-dnn library from 2016 to 2018.

Contributed in many Open Source projects such as OpenCV, kornia, tiny-dnn, Pytorch, ROS, Object Recognition Kitchen, OpenDroneMap and OpenSfM.

Participated in robotics competitions and campus such as the HUMABOT Robot Competition 2014 during the *IEEE-RAS International Conference on Humanoid Robots* (Madrid, Spain) and the RoCKIn Camp 2014 organized by La Sapienza University of Rome (Rome, Italy) within the company PAL Robotics.

Co-founder and member of the *La Konfraria de la Vila del Pingui*. An Open Source community, organizing local events and workshops spreading the free software culture.

Skills Competence: Geometric Computer Vision (local features, camera pose estimation, camera calibration), Deep Learning, Robotics, Programming, Open Source.
Programming Languages: Python, C++.
Programming Libraries: PyTorch, OpenCV, kornia, ROS.
Extra Interests: Git, Docker, Vim, CMake, Unix.
Languages: Catalan (native), Spanish (native), English (professional)

Software *kornia*: Open Source Differentiable Computer Vision Library in PyTorch.

tiny-dnn: header only, dependency-free deep learning framework in C++11.

Papers in Reviewed Proceedings

E. Riba, M. Dmytro, J. Shi, D. Ponsa, F. Moreno-Noguer, G. Bradski, "Kornia: an Open Source Differentiable Computer Vision Library for PyTorch", *Engineering Applications of Artificial Intelligence*, Under review.

E. Riba, M. Dmytro, D. Ponsa, E. Rublee, G. Bradski, "Kornia: an Open Source Differentiable Computer Vision Library for PyTorch", *WACV*, 2020.

XS. Poma, E. Riba, A. Sappa, "Dense extreme inception network: Towards a robust cnn model for edge detection", *WACV*, 2020.

A. Barrosso, E. Riba, D. Ponsa, K. Mikolajczyk, "Key.Net: Keypoint Detection by Handcrafted and Learned CNN Filters", **ICCV**, 2019.

V. Balntas, E. Riba, D. Ponsa, K. Mikolajczyk, "Learning local feature descriptors with triplets and shallow convolutional neural networks", **BMVC**, 2016.

Relevant Coursework

- *Object Detection* (Free online course, Universitat Autonoma de Barcelona. Fall 2015)
- *Machine Learning* (Free online course, Stanford. Fall 2014)
- *Introduction to Robot Operating System (ROS)* (Universitat Politecnica de Catalunya. Spring 2014)

References

Dr. Gary Bradski
OpenCV.org
garybradski@gmail.com

Dr. Daniel Ponsa
Computer Vision Center, Universitat Autonoma de Barcelona.
daniel@cvc.uab.es

Dr. Francesc Moreno-Noguer
Institut de Robotica i Informatica Industrial (CSIC-UPC)
fmoreno@iri.upc.edu

Dr. Vincent Rabaud
Google, Inc.
vincent.rabaud@gmail.com

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