

VINCENT RABAUD

Education

UNIVERSITY OF CALIFORNIA, SAN DIEGO

San Diego, CA, USA

01/2004–02/2009

Ph.D. in Computer Science

Dissertation: *Manifold Learning Techniques for Non-Rigid Structure from Motion*.

Advisor: Serge Belongie.

Research Interests: Structure from Motion, Multiview Geometry, Panorama, Image Manifold Learning, Tracking, Behavior Analysis, Optimization, Visual Captchas, Perception.

SUPAERO

Toulouse, France

09/2001–08/2003

M.S. in Aeronautical and Space Engineering, Space Imagery Major.

ECOLE POLYTECHNIQUE

Paris, France

09/1998–08/2001

B.S./M.S. in Applied Math, Fluid Mechanics and Parallel Computing.

Work Experience

ALDEBARAN

Paris, France

04/2013–now

SW/HW Link Director

- managing two 10-person teams: one focusing on the audio and visual perception of the robot (automated speech recognition, text to speech, object recognition, person detection) and one on its movement.
- handling the projects definitions, plannings, contracts, execution and participating to the code and technical decisions.
- since 09/2014, improving relationships between the software and hardware departments by relaying and defining the different plannings, decisions and implementations.

OPENCV FOUNDATION

06/2012–now

Co-Founder and Member of the Board of the official OpenCV library foundation

- representing the OpenCV library in public events.
- managing contracts and collaborations (e.g. during Google Summer Of Code).

WILLOW GARAGE

Menlo Park, CA, USA

01/2011–03/2013

Research Engineer

- designed and implemented new techniques for object recognition based on 2D/3D information.
- developed and managed part of the OpenCV library.
- worked on several projects related to the Robot Operating System like SLAM, build system, grasping.

VIDEOSURF

San Mateo, CA, USA

03/2009–01/2011

Software Engineer

- developed and implemented algorithms to visually analyze videos from the web using face recognition, video summaries and scene analysis.
- multiplied by 5 the speed of our processing pipeline up to 200K web videos a day on 30 machines.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

La Jolla, CA, USA

01/2004–02/2009

Graduate Student Researcher, Department of Computer Science and Engineering

CENTER FOR INTERDISCIPLINARY SCIENCE FOR ART, ARCHITECTURE
AND ARCHAEOLOGY (CISA3)

La Jolla, CA, USA

06/2007–09/2007

Intern

- with two other persons, designed a robot to scan artist paintings.
- created vision algorithms to create on the fly giga-pixel panoramas and visualize them in a web browser.

CALIT2

La Jolla, CA, USA

06/2005–09/2005

Intern, *RESCUE* Project

- designed and implemented algorithms to perform real-time crowd analysis for person counting and movement description.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

La Jolla, CA, USA

05/2003–12/2004

Intern, *Smart Vivarium* Project

- designed and implemented algorithms to perform automatic analysis of rodent behavior: breathing and sleeping frequencies, movement and tracking.

CENTRE NATIONAL D'ETUDES SPATIALES (CNES)

Toulouse, France

06/2002–12/2002

Intern, Space Mechanics Department, French Space Agency

- designed and implemented an algorithm to efficiently and accurately choose the best launch trajectory to avoid space debris.
- implemented a model of space explosion to study the movement of space debris due to collision.

OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES
(ONERA)

Toulouse, France

03/2002–06/2002

Intern, Flight Mechanics Department

- proved the optimal position of a glider for optimal fuel efficiency of the plane pulling it in flight.

DYNAFLOW-INC

Jessup, MD

04/2001–06/2001

Intern, Fluid Mechanics Modeling

- implemented an algorithm to describe the formation of cavities on underwater propellers.

Teaching Experience

UNIVERSITY OF CALIFORNIA, SAN DIEGO

La Jolla, CA, USA

CSE252C, *Object Recognition*, Fall 2007: Teaching Assistant

CSE166, *Image Processing*, Fall 2007: Teaching Assistant

Professional Activities

Co-founder and member of the board of the official OpenCV foundation.

Mentor and organizer of Google Summer of Code for OpenCV from 2011 to 2015.

Maintainer/developer of 60+ packages and involved in the core development of the Robot Operating System (ROS).

Reviewer: IEEE International Conference on Computer Vision, IEEE Conference on Computer Vision and Pattern Recognition, SIGGRAPH, IEEE Transaction on Pattern Analysis and Machine Intelligence, International Journal of Computer Vision

Organizer of Pixel-Cafe, the weekly vision and graphics seminar at UCSD.

IEEE member, 2005-present

Skills

Competence: Vision (SfM, web video analysis, image retrieval, object recognition), Robotics, Programming, Architecture, Management
Programming Languages: C++, Python
Programming Libraries: OpenCV, ROS, Boost, OpenMP, TBB, PVM, MPI
Extra Interests: Android, Drupal, Matlab, Javascript, PHP, NOSQL
Languages: French (native), English (bilingual), Spanish (fluent), Portuguese (beginner), Italian (beginner)

Software

ROS packages: maintainer/developer of 60+ ROS packages about computer vision, lasers, graph processing, the NAO robot.

Recognition Kitchen: set of tools to develop and execute object recognition.

Surveillance Video Entertainment System (SVEN): real-time tracking of pedestrians incorporating appearance description, face detection and facial expression analysis.

Painting Panorama: fast and memory efficient panorama software for very high resolution images of paintings. Incorporates sparse bundle adjustment, sift and camera auto calibration.

Vincent's Structure from Motion Toolbox for Matlab: toolbox including many common structure from motion algorithms (e.g. rigid, non-rigid, bundle adjustment, visualization).

Journal Articles

A. Ziegler, E. Christiansen, V. Rabaud, S. Belongie, D. Kriegman, "In submission", *IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI, in preparation)*, 2013.

Papers in Reviewed Proceedings

A. Ziegler, E. Christiansen, V. Rabaud, S. Belongie, D. Kriegman, "Match-time covariance for descriptors", **BMVC**, 2013.

S. Leutenegger, P. T. Furgale, V. Rabaud, M. Chli, K. Konolige and R. Siegwart, "Keyframe-Based Visual-Inertial SLAM using Nonlinear Optimization. ", (**RSS**), 2013.

M. Dimashova, I. Lysenkov, V. Rabaud, V. Eruhimov "Tabletop Object Scanning with an RGB-D Sensor" , 3rd Workshop on Semantic Perception, **ICRA**, 2013.

I. Lysenkov, V. Rabaud, "Pose Estimation of Rigid Transparent Objects in Transparent Clutter" , **ICRA**, 2013.

- E. Rublee, V. Rabaud, K. Konolige and G. Bradski, “ORB: an efficient alternative to SIFT or SURF” , *IEEE International Conference in Computer Vision*, (**ICCV**), 2011.
- V. Rabaud and S. Belongie, “Linear Embeddings in Non-Rigid Structure from Motion” , *IEEE Conference on Computer Vision and Pattern Recognition*, (**CVPR**), 2009.
- V. Rabaud and S. Belongie, “Re-Thinking Non-Rigid Structure From Motion” , *IEEE Conference on Computer Vision and Pattern Recognition*, (**CVPR**), 2008.
- S. Steinbach, V. Rabaud and S. Belongie, “Soylent Grid: it’s made of People !” , *Interactive Computer Vision, in conjunction with ICCV*, (**ICV**), 2007.
- P. Dollár, V. Rabaud and S. Belongie, “Non-Isometric Manifold Learning: Analysis and an Algorithm”, *International Conference on Machine Learning*, (**ICML**), 2007.
- P. Dollár, V. Rabaud and S. Belongie, “Learning to Traverse Image Manifolds” , *Neural Information Processing Systems*, (**NIPS**), 2006.
- V. Rabaud and S. Belongie, “Counting Crowded Moving Objects,” , *IEEE Conference on Computer Vision and Pattern Recognition*, (**CVPR**), 2006, pp. 705- 711, vol. 1.
- P. Dollár, V. Rabaud, G. Cottrell and S. Belongie, “Behavior Recognition via Sparse Spatio-Temporal Features,” *Joint International Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance*, (**VS-PETS**), 2005.
- S. Belongie, K. Branson, P. Dollár, and V. Rabaud, “Monitoring Animal Behavior in the Smart Vivarium,” *International Conference on Methods and Techniques in Behavioral Research*, 2005.
- V. Rabaud and S. Belongie, “Big Little Icons,” *IEEE Workshop on Computer Vision Applications for the Visually Impaired, in conjunction with CVPR*, (**CVAVI**), 2005.
- K. Branson, V. Rabaud and S. Belongie, “Three Brown Mice: See How They Run,” *Joint International Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance*, (**VSPETS**), 2003, pp. 78-85.
- V. Rabaud and B. Deguine “A Geometrical Approach To Determine Blackout Windows At Launch,” *AAS/AIAA Space Flight Mechanics Meeting*, Ponce, Puerto Rico, (**AAS**), 2003, 03-187

Video

M. Maschion, V. Rabaud and S. Belongie, *Computer Vision: Fact and Fiction*, Instructional DVD, 2005.

References

Prof. Serge Belongie

Cornell University
111 Eighth Avenue #302, New York, NY 10011, USA
sjb344@cornell.edu

Dr. Gary Bradski

Magic Leap
gbradski@magic Leap.com

Dr. Kurt Konolige

Google, Inc.
kkonolige@google.com

Dr. Brian Gerkey

Open Source Robotics Foundation
419 N Shoreline Blvd, Mountain View, CA 94043, USA
gerkey@osrfoundation.org

Prof. David Kriegman

University of California, San Diego Computer Science & Engineering
CSE-EBU3B 4120; 9500 Gilman Dr.; #0404 La Jolla, CA 92093-0404, USA
kriegman@cs.ucsd.edu

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