VINCENT RABAUD

Education

UNIVERSITY OF CALIFORNIA, SAN DIEGO — San Diego, CA, USA
01/2004–03/2009
Ph.D. in Computer Science
Dissertation: *Manifold Learning Techniques for Non-Rigid Structure from Motion.*
Advisor: Serge Belongie.
Research Topics: 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

GOOGLE — Paris, France
10/2015–now
Senior Software Engineer

- developing WebP.
- maintaining the internal OpenCV code.

OPENCV FOUNDATION
06/2012–now
Co-Founder and Member of the Board of the OpenCV library foundation

- representing the OpenCV library in public events to advertise the Open Computer Vision framework (10M downloads).
- managing contracts and collaborations (e.g. during Google Summer Of Code).

ALDEBARAN — Paris, France
04/2013–10/2015
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.

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.
- worked on several projects related to the Robot Operating System like SLAM, build system, grasping, community management.

VIDEOSURF San Mateo, CA, USA
03/2009–01/2011
Software Engineer

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

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.
- designed and implemented 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, USA
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

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 (Robot Operating System) packages about computer vision, lasers, graph processing, the Aldebaran robots.

Object 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, feature matching 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
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Open Source Robotics Foundation
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