Yoshua Alfredo Nava Chocrón

Curriculum Vitae

The heights by great men reached and kept
Were not attained by sudden flight,
But they, while their companions slept,
Were toiling upward in the night.
-Henry Wadsworth Longfellow-.

Education

2014 **Summer practicum, Embedded systems**, *North Carolina State University*, Raleigh, Grade: 20/20.

2009–2015 **Informatics Engineer**, *Universidad Católica Andrés Bello (UCAB)*, Caracas, GPA: 15,34/20.

Thesis project: I worked with Luis Vicens, another student at UCAB, on the development of the electronics, state estimation algorithms, wireless communication, ground station software, and PID control algorithms for stabilizing a low-cost quadrotor platform around the hovering point with a minimal array of sensors.

Student organizations

1. UCAB ITF Taekwondo group. Obtained a silver medal at the 4th General Choi National Cup, in the GUP degrees category.
2. UCAB Robotics and Automation group (ROAUCAB). Served as the coordinator of the student branch from June 2013 to September 2014. Developed, with other members of the group, a line follower robot to participate in the Venezuelan National Robotics Competition CCSBOTS2013.
3. UCAB Educational Robotics Group. I worked on the implementation of a small set of Pinguino control boards, developed a user manual to build and program the boards. implemented a set of light and touch sensors to be used with the boards, and produced a video tutorial to describe the boards construction process.

Honors and awards

1. Engineering Dean's list during the March-July semester of 2010.
2. Academic excellence recognition award. 2011-2012 academic year.
3. Recipient of a scholarship to attend the Latin American Conference on Informatics (CLEI) 2013, awarded by the Venezuelan National Endowment for Science, Technology and Innovation (FONACIT).
4. Ranked in top-5 percent of my class during all the academic years 2009-2015, and graduated as first.
5. Honorific mention on undergraduate thesis project.

Caracas – 1060 – Venezuela
✉ *yoshua.nava.chocron@gmail.com* • *yoshuanava.github.io*

Experience

Work/Research

March 2015 - present
Voluntary Research Assistant, *Mechatronics Research and Development Group at Universidad Simón Bolívar*, Caracas.
Evaluation of characteristics of monocular and stereo cameras, as well as low-cost lenses, for its utilization with visual SLAM algorithms. Currently working on the development of a vision-based navigation system for a mobile robot to find traversable areas and objects. General assistance and troubleshooting on the implementation of computer vision algorithms on the group research projects.

April-June and October-present (2015)
Computer Scientist, *Pleiades Robotics Inc.*, Montreal.
I work on a remote basis on the development of the flight control and vision systems, as well as the general code base for Spiri, the company's autonomous quadrotor.

2010-2015
Informatics assistant, *Funeraria San Pedro C.A.*, Caracas.
Enterprise computer systems installation, setup and troubleshooting.

August 2014 - October 2014
Intern, *Mechatronics Research and Development Group at Universidad Simón Bolívar*, Caracas.
I performed an analysis of the state of the art in the field of visual odometry, based on which the Semi-Direct Visual Odometry Robot Operating System package was selected to be implemented, tested and documented for the purpose of using it in an Autonomous Underwater Vehicle (AUV) in the near future.

Teaching

June 2015 - present
Community Teaching Assistant, *Autonomous Mobile Robots*, ETH-Zurich courses at edX.
I voluntarily assist students by solving any questions they may have about the topics of the course through its discussion forum. Furthermore, I cooperate closely with the official TA's and course coordinators, reporting any issues with the platform, and carefully following their directives.

2012–2014
Teaching assistant, *Universidad Católica Andrés Bello*, Caracas.
I served as a Teaching assistant for the subject "Calculus I for engineering" during five consecutive semesters. I worked with groups of approximately 20 students two times a week, answering their questions, preparing exercises and motivational activities, and evaluating their knowledge and dexterity.

Interests

Computer vision
Feature-based and dense methods for monocular and stereo visual odometry and SLAM. Superpixel oversegmentation. Deep learning.

Control theory
Optimal control and motion planning.

Nonlinear systems
Analytical and computational methods to study nonlinear systems behavior.

Embedded systems
Implementation of computer vision and optimal control algorithms on embedded platforms. Development of ROS packages for real-time trajectory optimization and model-predictive-control. Performance optimization of computer vision algorithms by the means of GPGPU programming.

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Complementary courses

Massive Open Online Courses (MOOC's)

- **Autonomous Mobile Robots**, offered by the Swiss Federal Institute of Technology in Zurich (ETH Zürich), in the summer of 2015. Main topics of the course were: robot kinematics, image processing, structure from motion, robot localization, SLAM and motion planning. Obtained a Honor Code Certificate with a grade of 99/100.
- **Object detection**, offered by the Autonomous University of Barcelona (UAB), in the spring of 2015. Main topics of the course were: object classification, object detection, HOG-SVM detector, Haar filters, Adaboost, domain adaptation, candidates generation and convolutional neural networks. Obtained a Verified Certificate with a grade of 88/100.
- **Robotic Vision**, offered by the Queensland University of Technology during the spring of 2015. Main topics of the course were: image processing, feature extraction, formation and geometry of images, 3D vision and visual servoing. Obtained a Certificate of Participation with a grade of 91/100.
- **Introduction to Robotics**, offered by the Queensland University of Technology, in the spring of 2015. Main topics of the course were: forward and inverse kinematics, robot joint control and rigid body dynamics. Obtained a Certificate of Participation with a grade of 93/100, and a congratulation from the instructor for succesfully building and programming a 2DOF robotic arm as the project course.
- **Image and Video Processing: From Mars to Hollywood with a stop at the hospital**, offered by Duke University at Coursera, in the spring of 2015. Main topics of the course were: image and video compression, spatial processing, restoration, segmentation, application of geometric deformations and partial differential equations, inpainting, sparse modeling and medical imaging. Obtained Verified Certificate with a grade of 100/100.
- **Underactuated robotics**, offered by the MIT at edX, in the fall of 2014. Main topics of the course were: nonlinear systems analysis, applied optimal and robust control and motion planning. Obtained Honor Code Certificate with a grade of 83/100.
- **Autonomous Navigation for Flying Robots**, offered by the Technical University of Munich at edX, during the spring of 2014. Course resolved around quadrotors autonomous navigation, divided in the following topics: 3D geometry and sensors, linear control, probabilistic state estimation, Kalman filters, visual odometry, and visual SLAM and 3D reconstruction. Obtained Honor Code Certificate, with a grade of 100/100.
- **Control of Mobile Robots**, offered by the Georgia Institute of Technology at Coursera, during the spring of 2014. Main topics of the course were: basic mobile robots models, linear systems, control systems design, hybrid systems and navigation. Obtained Statement of Accomplishment with Distinction, with a grade of 100/100.

- **Everything is the same: modeling engineered systems**, offered by Northwestern University, during the spring of 2014. Main topics of the course were: linear systems, mechanical systems, chemical diffusion, linear electrical circuits, and analogies between physical systems. Obtained Statement of Accomplishment, with a grade of 98/100.

Presential

- **2.0 Research**, offered by the Engineering Research and Development Center at Universidad Católica Andrés Bello. February 2014.

Conferences

2014-2015 **XII and XIII Conference on Telecommunications Engineering** *UCAB-UNEFA.*

2013 **XXXIX Latinoamerican Conference in Informatics.** *CLEI*

2010-2015 **III, IV, V, VI and VIII Intercollegiate Conferences in Computer Science.** *JOINCIC*

Languages

Spanish **Native proficiency.**

English **Full professional proficiency.** *TOEFL iBT Score: 109/120. Band scores (out of 30): Reading 30, Listening 27, Speaking 23, Writing 29.*

German **Elementary proficiency.** *CERF A1.1 course completed*

References

- Available upon request.

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