Nicolas LOY RODAS, PhD

Curriculum Vitae

July 6, 1989
(+33) 07 77 32 41 86
Nationality : El Salvador
nicolas.loyrodas@gmail.com
8 Rue Klein, 67000, Strasbourg, France

SUMMARY

PhD in Medical Robotics with 4 years of experience in object-oriented software development using **C++** for Computer Vision, Augmented Reality and Robotics applications (**OpenCV**, **PCL**, **VTK** and **Qt**) and in GPU programming using **CUDA**.

During my PhD, I led the development of a **radiation awareness system** for improving the monitoring of ionizing radiation during X-ray guided medical procedures. My work has led to **two patent applications**, several **publications in scientific journals/conferences** and to the development of a **prototype** system installed and **demonstrated in an operating room**.

Fluent in three languages, I possess a multicultural background, which has enabled me to develop great communication skills, along with a capability to quickly adapt to new environments.

Top skills : Computer Vision, Augmented/Virtual Reality, Computer-Assisted Medical Interventions, Software development, Oral/written scientific communication.

PROFESSIONAL EXPERIENCE

IHU Strasbourg, France 2018-Present
Research Engineer

Leader of a transfer of technology project : transfer of the X-ray radiation simulation and visualization frameworks developed during my PhD thesis to our industrial partner.

ICube Laboratory, University of Strasbourg, France 2015-2018
PhD Candidate in Medical Robotics

Led the development of a global radiation awareness system for providing real-time visual feedback of the radiation exposure during X-ray guided procedures. Proposed new approaches for :
- simulating the propagation of scattered radiation and the dose to patient and staff in real-time.
- providing in-situ visual feedback about radiation exposure by means of augmented and virtual reality.
- optimizing an X-ray device configuration to minimize radiation exposure.

Supplementary Video

ICube Laboratory, University of Strasbourg, France 2013-2015
Research Engineer : Computer Vision, Augmented Reality, Image processing

- Development of camera tracking and object detection approaches using RGBD cameras.
- Development of Monte-Carlo simulations of ionizing radiation propagation.

EDUCATION

PhD in Medical Robotics 2015-2018

University of Strasbourg, France

- Thesis : "Context-aware Radiation Protection for the Hybrid Operating Room".
- Advisors : Prof. Dr. Michel de Mathelin and Dr. Nicolas Padoy.

MSc. Imaging, Robotics and Biomedical Engineering 2011-2013

Telecom Physique Strasbourg Engineering School, France

- Study emphases : Computer Vision and Robotics.
- Master's Thesis : "Object Detection in the Interventional Room using RGB-D Cameras".

Engineer's degree (*Diplôme d'ingénieur*) 2011-2013

National Institute of Applied Sciences (INSA), Strasbourg, France

- Study emphases : Robotics, Mechatronics and Automation.
- Final project : "Automation feasibility analysis of a deburring station at Erimeca Group, Rosheim".

BSc. Mechatronics Engineering 2007-2011

Anahuac University of Merida, Yucatan, Mexico

- Study emphases : Mechatronics, Mechanical Design and Manufacturing.
- Bachelor's Thesis : "Design and construction of a vacuum oven for the creation of bimetallic alloys".

PATENT APPLICATIONS

Nicolas Padoy, Nicolas Loy Rodas, et al., *Method for determining a configuration setting of a source of ionizing radiation*, EU application, January 2017.

Nicolas Padoy and Nicolas Loy Rodas, *Method for estimating the spatial distribution of the hazardousness of radiation doses*, WO2016020278 A1, 2014.

RELEVANT PUBLICATIONS

N. Loy Rodas and N. Padoy, **Augmented Reality for reducing intraoperative radiation exposure to patients and clinicians during X-ray guided procedures**. In Terry Peters, Ziv Yaniv, and Cristian Linte, editors, Mixed and Augmented Reality in Medicine, 2018.

N. Loy Rodas *et al.*, **Pose Optimization of a C-Arm Imaging Device to Reduce Intraoperative Radiation Exposure of Staff and Patient During Interventional Procedures**, IEEE International Conference on Robotics and Automation (ICRA), 2017.

N. Loy Rodas, F. Barrera, N. Padoy, **See It With Your Own Eyes : Marker-less Mobile Augmented Reality for Radiation Awareness in the Hybrid Room**, IEEE Transactions on Biomedical Engineering (TBME), 2016.

N. Loy Rodas, N. Padoy, **Seeing Is Believing : Increasing Intraoperative Awareness to Scattered Radiation in Interventional Procedures by Combining Augmented Reality, Monte Carlo Simulations and Wireless Dosimeters**, International Journal of Computer Assisted Radiology and Surgery (IJCARS), MICCAI Special Issue, 2015.

Full list of publications: researchgate.net/profile/Nicolas_Loy_Rodas

SKILLS

Technical	Robotics, Computer Vision, Machine Learning, GPGPU Programming, Augmented/Virtual Reality, Medical Imaging, Computer Assisted Interventions
Languages	French (fluent : French High-School diploma obtained with honors in 2007) English (fluent : IBT TOEFL : 105/120 and TOEIC : 985/990) Spanish (native speaker)
Programming	C++, CUDA C, Python, MatLab
Libraries	OpenCV, Qt, PCL, VTK, Eigen, Boost, Geant4
Dev. tools	Visual Studio, Qt Creator, CMake, SVN, Batch
Others	Windows, Linux, Adobe After Effects, Adobe Illustrator

INTERESTS

Design	Website designer and publicity chair for the International Conference on Information Processing in Computer-Assisted Interventions : IPCAI 2017.
Writing	Co-author of the book *El pais que viene : Jovenes en el exterior* (2017).
Reading	Passionate reader of books about entrepreneurship, productivity, science, technology, futurology, history, business and management.

HONORS

Cum Laude Best Poster Awarded to my work *A global radiation awareness system using augmented reality and Monte Carlo simulations*, at the European Congress of Radiology (ECR) 2018.

Selected for a **long oral presentation** of my paper *Marker-less AR in the Hybrid Room using Equipment Detection for Camera Relocalization*, during the Medical Image Computing and Computer-Assisted Interventions (MICCAI) Conference, Munich, Germany, 2015.

Awarded with a **student travel award** to participate in the Medical Image Computing and Computer Assisted Interventions Conference (MICCAI), Munich, Germany, 2015.

Selected for a **long oral presentation** of my paper *3D Global Estimation and Augmented Reality Visualization of Intra-operative X-ray Dose*, during the Medical Image Computing and Computer-Assisted Interventions (MICCAI) Conference, Boston, USA, 2014.

Graduated with **highest honors** (top student) from Anahuac University of Merida, Yucatan, 2011.

Academic Excellence awarded by the Anahuac University of Merida each year from 2007 to 2011.