MARTIN ROA VILLESCAS

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EDUCATION

Ph.D. candidate *Feb 2018 - Dec 2025*
Eindhoven University of Technology (TU/e), The Netherlands
5-year Ph.D. Educational Program

M.Sc. in Embedded Systems *Sep 2011 – Aug 2013*
Eindhoven University of Technology (TU/e), The Netherlands
– *GPA:* 8/10
– *Thesis:* 3D Face Reconstruction using Structured Light on an
ARM-based Hand-held Device

B.Sc in Electronic Engineering *Aug 2005 – Jul 2010*
Universidad Nacional de Colombia (UNAL), Sede Manizales
– *GPA:* 4.6/5.0
– *Thesis:* Design and implementation of a classifier of common bird species
at the Rio Blanco reserve (Manizales, Colombia) on a mobile device

EXPERIENCE

Docent & Researcher *Aug 2023 – Present*
Fontys University of Applied Sciences, The Netherlands
Responsibilities:
– Docent of the Information and Communication Technology program
– Researcher in the area of Robotics and Smart Industry

Teacher *Nov 2020 – Aug 2023*
Eindhoven University of Technology (TU/e), The Netherlands
Courses: Autonomous Vehicles (5AID0), Embedded Visual Control (5LIA0)

Teaching Assistant *Nov 2018 – Aug 2020*
Eindhoven University of Technology (TU/e), The Netherlands
Courses: Computation I (5ELA0), Intelligent Architectures (5LIL0),
Embedded Systems Laboratory (5LIB0)

Embedded Systems Designer *Nov 2013 – Jan 2018*
Philips Research, Eindhoven, The Netherlands
Design, implementation, and documentation of embedded software/electronics

Research Assistant *Aug 2009 – Nov 2009*
Universidad Nacional de Colombia (UNAL), Sede Manizales
Project: Multiple classifier systems for the automatic recognition of seismic
events at the Cerro Machín-Cerro Bravo volcanic complex

Teaching Assistant *Aug 2008 – Jun 2009*
Universidad Nacional de Colombia (UNAL), Sede Manizales
Courses: Analog Electronics I, Electronic Design

HONORS AND DISTINCTIONS

Huygens Scholarship *Sep 2011 – Aug 2013*
Dutch Ministry of Education, Culture and Science
Full M.Sc. scholarship at Eindhoven University of Technology (TU/e)

Best GPA *Aug 2005 – Jul 2010*
UNAL, Sede Manizales
Best GPA (4.6/5.0) in the B.Sc. in Electronic Engineering (class 2005-2010)

PAES Scholarship *Aug 2005 – Jul 2010*
UNAL, Sede Manizales
Full B.Sc. scholarship at UNAL, Sede Manizales

National Robot Olympics *Sep 2009*
Universidad Pontificia Bolivariana, Sede Medellín
First place in the line-follower category

UNAL Line Follower Robot Contest *May 2009*
UNAL, Sede Manizales
First place

PUBLICATIONS

- **M. Roa-Villescas, X. Gao, S. Stuijk, H. Corporaal, and J.-G. Liu**, *"Probabilistic Inference in the Era of Tensor Networks and Differential Programming"* in *Physical Review Research*, American Physical Society, 2024, doi: 10.1103/PhysRevResearch.6.033261.

- **P. W. A. Wijnings, M. Roa-Villescas, S. Stuijk, B. de Vries and H. Corporaal**, *"On the Importance of the Execution Schedule for Bayesian Inference"* in *ACM Transactions on Probabilistic Machine Learning*, Association for Computing Machinery, New York, NY, USA, 2024, doi: 10.1145/3690830.

- **M. Roa-Villescas, J. G. Liu, P. W. A. Wijnings, S. Stuijk and H. Corporaal**, *"Pushing the Boundaries of Probabilistic Inference Through Message Contraction Optimization"* in Artificial Intelligence: Machine Learning, Convolutional Neural Networks and Large Language Models, L. Deligiannidis, G. Dimitoglou, and H. Arabnia, Eds., Walter de Gruyter GmbH, 2024, pp. 27-50, doi: 10.1515/9783111344126-002.

- **M. Roa-Villescas, J. G. Liu, P. W. A. Wijnings, S. Stuijk and H. Corporaal**, *"Scaling Probabilistic Inference Through Message Contraction Optimization"* in 2023 Congress in Computer Science, Computer Engineering, and Applied Computing, CSCE 2023, Institute of Electrical and Electronics Engineers, 2024, pp. 123-130, doi: 10.1109/CSCE60160.2023.00025.

- **M. Roa-Villescas, J. G. Liu**, *"TensorInference: A Julia Package for Tensor-Based Probabilistic Inference"* in Journal of Open Source Software, vol. 8, no. 90, 2023, p. 5700, doi: 10.21105/joss.05700.

- **M. Roa-Villescas, P. W. A. Wijnings, S. Stuijk and H. Corporaal**, *"Partial Evaluation in Junction Trees"* in 2022 25th Euromicro Conference on Digital System Design (DSD), Maspalomas, Spain, 2022, pp. 429-437, doi: 10.1109/DSD57027.2022.00064.

- **B. Ergül, T. van de Laar, M. Koudahl, M. Roa-Villescas, and B. de Vries**, *"Learning Where to Park"*. Poster session presented at 1st International Workshop on Active Inference (IWAI 2020), Ghent, Belgium. Full Text PDF.

- **M. Roa-Villescas, B. de Vries, S. Stuijk, and H. Corporaal**, *"Real-time Audio Processing for Hearing Aids using a Model-based Bayesian Inference Framework"* in Proceedings of the 23th Inter-

national Workshop on Software and Compilers for Embedded Systems (SCOPES '20). Association for Computing Machinery, New York, NY, USA, 82–85, 2020, doi: 10.1145/3378678.3397528.

– **M. Roa-Villescas, F. van Heesch, and G. de Haan**, *"3D Face Reconstruction using Structured Light on a Hand-held Device"*. Master's Thesis, Eindhoven University of Technology, Eindhoven, The Netherlands, August 2013. Full Text PDF.

– **M. Roa-Villescas and M. Orozco Alzate**, *"Bird in the Hand: An Electronic Field Guide App for Bird Watchers,"* in IEEE Potentials, vol. 31, no. 2, pp. 8-14, March-April 2012, doi: 10.1109/MPOT.2011.2178281.

LANGUAGES

– **Spanish:** Native
– **English:** Fluent
– **Dutch:** Fluent

REFERENCES

Carlos Enrique Ruiz
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Carrera 17 No. 71-87
Manizales (Caldas), Colombia
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