Nicolas Van der Noot

Ph.D. Electromechanical Engineer

Born on October 11, 1990
in Brussels

Belgian nationality
Driving license B

Contact
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Professional Profile

Experienced software engineer with a focus on cutting-edge AI software development.
Specialized in machine learning, computer vision, 3D geometry, simulation, robotics and control.
Responsible for projects involving up to 7 software engineers (project and team lead experience).

Career

Since 2023 **Staff engineer | Sony Depthsensing Solutions**
Mix of team lead and active development activities for car safety applications.
Steering projects with other managers to meet the needs of customers.

2019-2023 **Senior Software Engineer | Sony Depthsensing Solutions**
Computer vision developments for next generation automotive in-cabin software.
Project and team lead activities.

2018-2019 **R&D Software Engineer | Sony Depthsensing Solutions**
Computer vision and machine learning software applications.

2017 **Research assistant - Ph.D. | Université catholique de Louvain**
Robotics and control research for the WALK-MAN project (follow-up to Ph.D. thesis).

Education

2013-2017 **Ph.D. candidate - F.R.S.-FNRS Aspirant**
Joint Ph.D. thesis between UCL | Université catholique de Louvain
and EPFL | École Polytechnique Fédérale de Lausanne.

2011-2013 **Master of Science in Engineering**, electromechanical orientation (mechatronics)
UCL | Université catholique de Louvain - All years: Highest honors

2008-2011 **Bachelor of Science in Engineering**, specialization in electricity and mechanics
UCL | Université catholique de Louvain - All years: Highest honors

Experience

Since 2022 **Project and team lead** | Responsible for an automotive project and the team working on it (up to 7 engineers). Planning with other managers and leading the team to reach the objectives in a timely manner.

Since 2018 **Development of computer vision solutions**
Main focus on the car industry needs, for safety and entertainment features.
Work presented several times at the Consumer Electronics Show (Las Vegas).

Since 2013 **Experience in machine learning**
Metaheuristic Optimization techniques (GA, PSO...) and Deep Neural Networks.
Implementation of the full pipeline from data collection to training and deployment.

2013-2017 **Robotics control** | AI control software design and optimization for robotic applications.

Publication of 12 papers | Journal and Conference papers
(including their presentation in international conferences).

Development of the Robotran simulation software
C/C++ pipeline, real-time interactions, 3D visualization (*OpenGL*).

Student projects supervision | 4 courses, 1 semester project and 6 master theses.

2012-2013 **Erasmus exchange student at EPFL** | 6 months, Switzerland.

2012 **Eurobot cup** | International amateur robotics contest (2^{nd} place of Belgium)

Awards

2016 Second place for **Best Conference Paper Award** at BIOROB 2016 (2^{nd} author).

2014 Third place at the **2014 IEEE Region 8 Student Paper Contest** (1^{st} author).

2013 **Best master thesis** awarded by the UCLouvain IEEE Student Branch.

2013 **Prix Pierre Decoux 2013** for the best master thesis awarded by Alumni Ingénieurs Louvain.

Ph.D. thesis

Title *Rich and Robust Bio-Inspired Locomotion Control for Humanoid Robots*

Description Implementation of bio-inspired controllers to achieve dynamic walking on humanoid robots. The purpose was to obtain robust and human-like walking with biped robots, while steering their gait. This was a joint Ph.D. thesis between UCL and EPFL.

Languages

French Mother tongue

English Fluent (spoken & written)

Dutch Professional (spoken & written)

Computer skills

Languages C/C++, Python, C#, Matlab, Java, html, CSS, JavaScript, PHP, SQL, Latex

Tools, libraries Git, Mercurial, Gitlab, Jira, OpenGL, OpenCV, Qt, PyQt, SDL, TensorFlow, Keras, NNabla, CMake, CI/CD, conan, Jupyter Notebook, marimo, Unity, Unreal Engine

Personal interests

I am passionate about programming, numerical simulations, artificial intelligence, graphics computing, 3D geometry and robotics. On a non-professional note, I enjoy playing badminton and tennis, walking, running, cycling, photography, as well as playing and developing video games.

Publications

Journal

Van der Noot N, Ijspeert AJ and Ronsse R (2019) **Neuromuscular model achieving speed control and steering with a 3D bipedal walker**. Autonomous Robots, 43(6): pp. 1537–1554. DOI:10.1007/s10514-018-9814-6.

Van der Noot N, Ijspeert AJ and Ronsse R (2018) **Bio-inspired controller achieving forward speed modulation with a 3d bipedal walker**. The International Journal of Robotics Research, 37(1): pp. 168–196. DOI:10.1177/0278364917743320.

Zobova AA, Habra T, **Van der Noot N**, Dallali H, Tsagarakis NG, Fisette P and Ronsse R (2017) **Multi-physics modelling of a compliant humanoid robot**. Multibody System Dynamics, 39 (1-2), pp. 95-114. DOI: 10.1007/s11044-016-9545-4.

Conference

Van der Noot N, Ijspeert AJ and Ronsse R (2020) **Trajectory Planning of a Bio-inspired Walker in 3D Cluttered Environments using Internal Models**. In: 2020 8th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob), New York (virtual), 29 November-02 December 2020, pp. 727-733. DOI: 10.1109/BioRob49111.2020.9224461.

Greiner P, **Van der Noot N**, Ijspeert AJ and Ronsse R (2018) **Continuous Modulation of Step Height and Length in Bipedal Walking, combining Reflexes and a Central Pattern Generator**. In: 2018 7th IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), Twente, 26-29 August 2018, pp. 342-349. DOI: 10.1109/BIOROB.2018.8487799.

Harding M, **Van der Noot N**, Somers B, Ronsse R and Ijspeert AJ (2018) **Augmented Neuromuscular Gait Controller Enables Real-time Tracking of Bipedal Running Speed**. In: 2018 7th IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), Twente, 26-29 August 2018, pp. 364-371. DOI: 10.1109/BIOROB.2018.8488054.

Heremans F, **Van der Noot N**, Ijspeert AJ and Ronsse R (2016) **Bio-inspired balance controller for a humanoid robot**. In: 2016 6th IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), Singapore, 26-29 June 2016, pp. 441-448. DOI: 10.1109/BIOROB.2016.7523667.

Colasanto L, **Van der Noot N** and Ijspeert AJ (2015) **Bio-inspired walking for humanoid robots using feet with human-like compliance and neuromuscular control**. In: 2015 IEEE-RAS 15th International Conference on Humanoid Robots (Humanoids), Seoul, 3-5 Nov. 2015, pp. 26-32. DOI: 10.1109/HUMANOIDS.2015.7363518.

Van der Noot N, Colasanto L, Barrea A, van den Kieboom J, Ronsse R and Ijspeert AJ (2015) **Experimental validation of a bio-inspired controller for dynamic walking with a humanoid robot**. In: 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Hamburg, Sept. 28 2015-Oct. 2 2015, pp. 393-400. DOI: 10.1109/IROS.2015.7353403.

Zobova AA, Habra T, **Van der Noot N**, Dallali H, Tsagarakis NG, Fisette P and Ronsse R (2015) **Multi-physics modelling of a compliant humanoid robot**. In: ECCOMAS Thematic Conference Multibody Dynamics 2015, Barcelona, 29 June-02 July 2015.

Van der Noot N, Ijspeert AJ and Ronsse R (2015) **Biped gait controller for large speed variations, combining reflexes and a central pattern generator in a neuromuscular model**. In: 2015 IEEE International Conference on Robotics and Automation (ICRA), Seattle, WA, 26-30 May 2015, pp. 6267-6274. DOI: 10.1109/ICRA.2015.7140079.

Van der Noot N and Barrea A (2014) **Zero-Moment Point on a bipedal robot under bio-inspired walking control**. In: MELECON 2014 - 17th IEEE Mediterranean Electrotechnical Conference, Beirut, 13-16 April 2014, pp. 85-90. DOI: 10.1109/MELCON.2014.6820512.