# 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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# Education

**Since 2017**    **Research assistant - Ph.D.**
Research for the WALK-MAN project, UCL | Université catholique de Louvain.

**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.
Two years in Belgium (UCL) and two years in Switzerland (EPFL).

**2011-2013**    **Master of Science in Engineering**, electromechanical orientation (mechatronics)
UCL | Université catholique de Louvain.
$1^{st}$ Year - Highest honors, $2^{nd}$ Year - Highest honors

**2008-2011**    **Bachelor of Science in Engineering**, specialization in electricity and mechanics
UCL | Université catholique de Louvain.
$1^{st}$ Year - Highest honors, $2^{nd}$ Year - Highest honors, $3^{rd}$ Year - Highest honors

# Experience

**2013-2017**    **Development of the Robotran simulation software**
In parallel to my Ph.D. research activities, I integrated the development team of the
Robotran software, a multi-body simulation environment developed within UCL. My
main contributions include: a framework based on *CMake* to configure and run the
software on multiple OS, real-time interactions with the simulator, dynamic plotting
tools using *SDL* (in real-time) and a 3D visualization environment using *OpenGL*.

**2013-2017**    **Student projects supervision**
On top of the research carried out during my Ph.D. thesis, I supervised the projects and
practical sessions of four different courses (both at UCL and EPFL). I also organized
the project of a BEST (*Board of European Students of Technology*) course. Finally, I
supervised four master theses and one semester project.

**2012-2013**    **Erasmus exchange student in Lausanne**
EPFL | École Polytechnique Fédérale de Lausanne (Switzerland), courses and master
thesis (5 months during fall semester).

**2011 & 2013**    **Tutor in physics**
Tutoring in Physics for UCL students in Bac 1: I was in charge of the exercise sessions
of 24 students.

**2012**    **Eurobot cup**
Participation in the $15^{th}$ edition of Eurobot, an international amateur robotics contest
in a team of 5 students ($2^{nd}$ of Belgium and participation in the European final).

# Awards

**2016**    Second place for the **Best Conference Paper Award** at the 6<sup>th</sup> IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, for the paper *Bio-inspired balance controller for a humanoid robot* (second author).

**2014**    Third place at the **2014 IEEE Region 8 Student Paper Contest**, for the paper *Zero-Moment Point on a Bipedal Robot under Bio-Inspired Walking Control* (first author).

**2013**    **Best master thesis** in the fields of the Institute of Electrical and Electronics Engineers awarded by the UCLouvain IEEE Student Branch.

**2013**    Grand Prix - **Prix Pierre Decoux 2013** for the best master thesis awarded by AILouvain (Alumni Ingénieurs Louvain).

**2008**    **Top of the promotion** (96%) at the admission exam to the Bachelor in Engineering.

# 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 is to obtain robust and human-like walking with biped robots, while steering their gait. This is a joint Ph.D. thesis between two institutes: UCL (within the *Center for Research in Mechatronics* laboratory) and EPFL (within the *Biorobotics* laboratory).

# Languages

**French**    Mother language

**English**    Fluent (spoken & written)

**Dutch**    Intermediate (spoken & written)

# Computer skills

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

**Tools, libraries**    Git, CMake, OpenGL, SDL

# Personal interests

I enjoy playing badminton and tennis, walking, running and photography.

# Publications

## Journal papers

**Van der Noot N**, Ijspeert AJ and Ronsse R (accepted) **Bio-inspired controller achieving forward speed modulation with a 3D bipedal walker**. International Journal of Robotics Research.

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 papers

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.

## Poster presentations

**Van der Noot N**, Ijspeert AJ and Ronsse R (2016) **Neuro-Muscular Controller Based on Reflexes and a Central Pattern Generator to Achieve Gait Modulation**. In: KoroiBot Final Workshop, Heidelberg, 13-14 September 2016.

**Van der Noot N**, Ijspeert AJ and Ronsse R (2016) **Humanoid Robot Control Recruiting Muscles, Reflexes and a Central Pattern Generator**. In: IEEE-EMB Benelux Chapter and the 14th National Day on Biomedical Engineering, Brussels, 4 March 2016.

**Van der Noot N**, Colasanto L, Ronsse R and Ijspeert AJ (2015) **Porting Reflex-Based Muscles Control to Real Humanoid Robots**. In: 2015 IEEE International Conference on Robotics and Automation (ICRA) - Workshop on Dynamic Locomotion and Balancing, Seattle, WA, 26 May 2015.

**Van der Noot N**, Dzeladini F, Ijspeert AJ and Ronsse R (2014) **Simplification of the Hill Muscle Model Computation for Real-Time Walking Controllers with Large Time Steps**. In: Dynamic Walking, Zurich, 10-13 June 2014.