

# Tom Van Cutsem

## Curriculum Vitae

### Personal

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Languages: Dutch (Mother Tongue), English (Fluent), French (Elementary)

### Education

**Oct. 2004 - May 2008:** PhD in Computer Science, Vrije Universiteit Brussel, Greatest Distinction.

- Doctoral dissertation: “Ambient references: object designation in mobile ad hoc networks”. Promoters: Prof. Dr. Wolfgang De Meuter, Prof. Dr. Theo D’Hondt.
- My PhD contribution is a scripting language for mobile phones named **AmbientTalk**. The language runtime is written in Java and runs on Android, J2SE and J2ME devices. AmbientTalk is a distributed programming language, based on actors (message-passing concurrency). AmbientTalk was featured at **droidcon.be** 2011 in Brussels and covered in the popular local IT magazine **Datanews** (<http://goo.gl/B35V4x>).
- In July 2010 I gave an Invited Talk on AmbientTalk at the First Emerging Languages Camp, co-located with the O’Reilly Open Source Conference (OSCON) in Portland, Oregon. My talk was subsequently featured in an article in **MIT Technology Review** (<http://goo.gl/n0TGA>), and I got interviewed by **Microsoft Channel 9** (<http://goo.gl/4Uk8rB>, 40.000+ views).

**Oct. 2000 - June 2004:** Master of Science (MSc) in Computer Science, Vrije Universiteit Brussel, Greatest Distinction (GPA 18.76 / 20 or 93.8%).

- Upon graduating, I received the “**Science Award**” which is awarded yearly by the university’s Faculty of Sciences to the graduated student with the overall best grades seen over his/her entire course of study.

# Professional Experience



**Nov. 2016 - present:** Department Head at **Nokia Bell Labs** Antwerp, Belgium

- Leading a research team working at the cutting edge of software engineering research. Broad areas of interest include code generation, query languages, deep learning, IoT networking and distributed ledger tech.
- Thought leader on Nokia's strategy to embrace Artificial Intelligence in research. Visibility at the level of Nokia CEO, CTO and Board of Directors.

**Feb. 2014 - Nov. 2016:** Senior Researcher at **Nokia Bell Labs** Antwerp, Belgium

- Architected and co-authored a distributed stream processing platform ( [worldwidestreams.io](http://worldwidestreams.io) ) powering **mobile situational awareness** applications, with a focus on **query processing** and **real-time geofencing** of mobile objects. Our demonstrator on Building Connected Car Applications on Top of the World-Wide Streams Platform won the Best Demo award at the ACM DEBS 2017 conference.
- Worked on various research projects where my goal was to oversee the complete execution of the project. This involved maturing the initial ideas, designing an architecture, implementation (hands-on programming) and presenting demonstrators to various stakeholders (customers and senior executives, project partners & sponsors, press, etc.)

**Jan. 2010 - Sept. 2014:** Professor of computer science at **Vrije Universiteit Brussel**, Belgium



- My research group was part of the [Software Languages Lab](http://www.software-languages.com) (SOFT).
- Authored over 60 peer-reviewed **publications** (since 2005). For a full list of my academic publications, citations and rankings, see my profile on Google Scholar: <http://goo.gl/DsUJv>
- I was responsible for **teaching** three university courses and independently developed an advanced Master-level course on “**Multicore Programming**” and an introductory Bachelor-level course on “Distributed Systems” (both 30 hours of lectures).
- I built up an extensive **network** with researchers from universities worldwide and from industry, including Google Research, HP Labs, Mozilla Research, IBM Research, Intel Labs, MSR.
- Presented numerous papers, **invited talks**, tutorials and posters at various international conferences. A full list of my talks is available online: <http://goo.gl/epgQUP>
- Acquired research **project funding** including 2 personal research grants, 2 PhD student grants and 4 project grants from regional governments, the Flemish Research Foundation and local university funding (the total budget of these grants exceeding well over 1M EUR).



**Nov. 2009 - April 2010:** Visiting Faculty at **Google**, Mountain View, CA, USA

- As part of my Post-doctoral research, I spent 6 months at the Google HQ in the US as a Visiting Faculty to work on improving the **JavaScript** language (<https://goo.gl/0JpL5x>). My activities are summarized in a Google Tech Talk (<http://goo.gl/cUhpo>, 7500+ views).
- Sat on the ECMA technical committee that standardizes the JavaScript language, as a Google representative. Contributed to the [ECMA-262](http://ecma-262.org) 6th Edition (aka **ECMAScript 2015**) standard.
- Developed a meta-programming API for Javascript (<http://goo.gl/S4l7D>) that became standardized as part of ECMAScript 2015 (<http://goo.gl/j25yf>) and which is now widely implemented across major browsers. This API has become a **cornerstone technology** of the Web.



## Oct. 2008 - Jan. 2014: Postdoctoral Fellow of the Research Foundation - Flanders (FWO)

- The FWO is Belgium's “National Science Foundation”. It is the most prestigious research funding organisation of the country (acceptance rate for Postdoctoral Fellow grants is < 30%).
- I was awarded a three-year personal fellowship to fund my research on distributed programming languages at the Vrije Universiteit Brussel. In October 2011, my fellowship was successfully renewed for another three-year period.

## Oct. 2004-Sept. 2008: PhD student with a fellowship of the Research Foundation, Flanders (FWO)

- Finished my PhD in 3.5 years at the Programming Technology Lab of the Vrije Universiteit Brussel, funded by the most prestigious research grant available to Belgian PhD students.
- As a course assistant for the **Computer Graphics** course, acquired a solid background in computational geometry.

## Membership in organizations

- 2010-2015: Member of the **ECMA TC39** standardization committee for ECMAScript (as a representative of Vrije Universiteit Brussel).
- Founding member of the **IFIP** Working Group 2.16 on [Programming Language Design](#).
- 2010-2014: Member of the scientific steering committee of the [ExaScience](#) Lab, part of **Intel**'s European research labs located in Leuven, Belgium. Research on exascale high-performance computing, in close cooperation with industry partners such as Intel and J&J.
- 2009–2014: Co-organizer and member of the Jury of regional and national **programming contests** for kids in high-school and students at university, including the [Belgian Olympiad in Informatics](#) and the [Flemish Programming Contest](#) (I was the main organizer of the 5th edition in 2013, hosted at my university, attracting 500 contestants).

## Code projects

- I maintain a JavaScript “polyfill” library originally designed to use the current ECMAScript 2015 [reflection API](#) before it was implemented natively in browsers (>300 stars on GitHub)
- Author of a minimal and portable Javascript library for Trait composition ([github.com/traitsjs/traits.js](https://github.com/traitsjs/traits.js)), also featured on popular web developer website [Ajaxian.com](#) (April 13th, 2010).
- I wrote a spec-compliant [ECMAScript 5 parser](#) in Javascript using a PEG parser generator.
- With my graduate student Tim Coppieters, developed [CloudTypes.js](#), a JavaScript library that supports data replication for web applications with eventual consistency guarantees.
- To teach students about Software Transactional Memory, I wrote a [meta-circular STM](#) in Clojure.
- Principal architect of the AmbientTalk programming language ([ambienttalk.googlecode.com](http://ambienttalk.googlecode.com)).

## Software engineering skills

- I'm a **programming languages enthusiast** and consequently I like to expose myself to many different programming languages and paradigms. I consider myself proficient (i.e. wrote programs over 10K LoC) in **Java** and **JavaScript** (node.js). I also have past experience with C/C++, Erlang, Clojure, Ruby, Python, Scheme and Prolog. I have some experience with Scala, Smalltalk, Visual Basic and Matlab. I am comfortable picking up new languages and frameworks quickly.
- Strong background in concurrency control (locks, threadpools, STM, actors, event loops, CAS,...)
- Writing academic papers has honed my technical writing and presentation skills.

**References** to colleagues and collaborators that can endorse my work are available on request.