Tom Van Cutsem

Curriculum Vitae

Personal

Residence
Leuven, Belgium

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

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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". Promotors: Prof. Dr. Wolfgang De Meuter, Prof. Dr. Theo D'Hondt.
- My PhD contribution is a scripting language for writing collaborative mobile apps named **AmbientTalk**. The language runtime is written in Java and runs on Android and J2ME. 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%).

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.

NOKIA Bell Labs

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

- Architected and co-authored a distributed stream processing platform (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 (SOFT).
- Authored 60+ peer-reviewed **papers** (with 1000+ citations). 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 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.

Awards

- ACM SIGPLAN Dynamic Languages Symposium 2017 Most Influential Paper Award for 2007 for my academic work on Reflection, which formed the basis for my contributions to JavaScript.
- Upon graduating as a Master in Computer Science at VUB, 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.

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), 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).

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.