Vito Kortbeek

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Education

Delft University of Technology — *Delft, the Netherlands*

PhD Student — *Feb. 2019 - present* ***(exp. grad. Jan. '23)***

Delft University of Technology — *Delft, the Netherlands*

Master Embedded Systems (+ one year pre-master) — *Sep. 2015 - Feb. 2019*

Amsterdam University of Applied Sciences — *Amsterdam, the Netherlands*

Bachelor Electrical Engineering (HBO) — *Sep. 2011 - July 2015*

Research Interests

My Ph.D. research focuses on **intermittent computing** support, ensuring that low-power battery-less embedded systems continue where they left off after a total power failure. I prefer to do this in such a way that it is invisible to the programmer. Doing so often involves **compiler transformations** and modifications. I enjoy exploring how to improve CPU architectures or utilize existing features better; especially when both software and **embedded** hardware come together. This includes leveraging underutilized architecture features in the compiler or figuring out how to exploit them in (low-level) software.

Publications

WARio: Efficient Code Generation for Intermittent Computing — **PLDI '22**

ACM SIGPLAN Conference on Programming Language Design and Implementation — *Jun. 13 - 17, 2022*

Vito Kortbeek, Souradip Ghosh, Josiah Hester, Simone Campanoni, Przemysław Pawełczak

https://doi.org/10.1145/3519939.3523454

https://github.com/TUDSSL/WARio

https://zenodo.org/record/6413018

BFree: Enabling Battery-free Sensor Prototyping with Python — **UbiComp '21**

ACM International Joint Conference on Pervasive and Ubiquitous Computing — *Sep. 21 - 26, 2021*

Vito Kortbeek, Abu Bakar, Stefany Cruz, Kasim Sinan Yildirim, Przemysław Pawełczak, Josiah Hester

https://dl.acm.org/doi/abs/10.1145/3432191

https://github.com/TUDSSL/BFree

Adafruit, Hackaday, Independent, Tweakers, TechXplore, AD, Volkskrant.

Battery-Free Game Boy — **UbiComp '20**

ACM International Joint Conference on Pervasive and Ubiquitous Computing — *Sep. 12 - 17, 2020*

Jasper de Winkel, **Vito Kortbeek**, Josiah Hester, Przemysław Pawełczak

https://dl.acm.org/doi/abs/10.1145/3411839 *Distinguished Paper Award*

https://github.com/TUDSSL/ENGAGE

CNET, The Wall Street Journal, Mashable, Hackaday, The Verge, Gizmodo, Engadget, PCMag, The Register, Tech Times, Nintendo Life, Daily Mail, The Independent.

Time-sensitive Intermittent Computing Meets Legacy Software — **ASPLOS '20**

ACM International Conference on Architectural Support for Programming Languages and Operating Systems — *Mar. 16 - 20, 2020*

Vito Kortbeek, Kasim Sinan Yildirim, Abu Bakar, Jacob Sorber, Josiah Hester, Przemysław Pawełczak

https://dl.acm.org/doi/10.1145/3373376.3378476

https://github.com/TUDSSL/TICS

https://zenodo.org/record/3563082

Projects

Wireless Sensor System

Noordwijk, the Netherlands

Head Communications, ESA Business Incubation Centre—**BSc Graduation Project Internship** *Feb. 2015 - Sep. 2015*

- Designed hardware for GSM, Bluetooth, and GPS connectivity
- Designed hardware and software for utilizing a Linux System on Module
- Designed modular data distribution software using ZeroMQ
- Designed a Bluetooth Android app that reads QR codes and transfers this data to an embedded Linux system

Porting an SNMP Stack to a DSP Platform

Landsmeer, the Netherlands

Micro Elektronische Producten (MEP)—**Internship** *Sep. 2013 - Feb. 2014*

- Porting a Simple Network Management Protocol (SNMP) stack to work on their TI DSP platfrom
- Making encryption work on their exotic DPS architecture
- Extending the SNMP solution with IPC features for their custom RTOS

Shell Eco-Marathon & Solar Boat Challenge

Amsterdam, the Netherlands

Amsterdam University of Applied Sciences *Sep. 2012 - Aug. 2013*

I worked with a team (10+) of fellow electrical engineering students on the electrical system of a prototype car that runs on hydrogen, named the H2A, and a solar boat. 🏆 ***First Place Awarded to H2A***

- Designed a graphical OLED display driver
- Designed a data-logger using flash memory chips and a micro-controller
- Designed a PC based logger for the hydrogen fuel cell
- Designed a GPS system (witch was also used in the H2A car)
- Designed a brushless DC and normal DC motor driver
- Designed a android and a web based application for displaying the current location of the H2A car and solar boat

Experience

Delft University of Technology

Delft, the Netherlands

PhD. Candidate *Feb. 2019 - **(exp. grad. Jan. '23)***

I am currently a forth year PhD candidate at the Delft University of Technology.
My supervisors are **Dr. Przemysław Pawełczak** and **Prof. dr. Koen G. Langendoen**.

Micro Elektronische Producten (MEP)

Landsmeer, the Netherlands

Junior software developer *Feb. 2014 - Sep. 2015*

At MEP I worked with a group of approximately 7 people on the software development for a Texas Instrument DSP with an RTOS used for a multitude of applications related to Voice over IP. The system was mostly used for maritime applications.

- Simple Network Management Protocol (SNMP) integration.
- Solving software bugs/issues.
- Implementing zero-copy messaging between tasks.
- Displaying logging information on the integrated web server.

Skills

Programming	C, C++, Java, Python, Assembly (ARM, MSP), Bash, Matlab, Lua, VHDL
Software	Vim, gcc, clang, llvm, gdb, make, cmake, Docker, LTSpice, Eagle, Altium Designer, ModelSim, Quartus
Large Project Experience	I am familiar with the GCC MSP back-end, LLVM middle-end, LLVM MSP back-end, LLVM ARM back-end
Languages	Dutch, Native language; English, Proficient (Average IELTS band 8—C1 CEFR skill level)

Personal Information

Nationality	Dutch
Date of Birth	17th May 1994
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