

# Niclas Hedam

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## Summary

I am an accomplished and dedicated PhD Fellow at the IT University of Copenhagen, where I am currently pursuing a PhD in computer science, specialising in data systems. My research interests lie at the intersection of security and data systems. I aim to understand and address the challenges of guaranteeing the availability, integrity and confidentiality of modern data systems and computational storage.

I completed my undergraduate education by earning a Bachelor's degree in Software Development in 2019. I then went on to pursue a Master's degree in Computer Science in 2022, where I specialised in the field of information security.

Before my current role as a PhD Fellow, I worked at ITU as a Research Assistant. This experience provided me with valuable opportunities to collaborate with esteemed researchers and gain a thorough understanding of the various challenges and opportunities in the field of data systems.

Currently, I am working in the context of DAPHNE to explore and experiment with eBPF-based offload on computational storage in large-scale data pipelines. This project aims to improve the efficiency and scalability of data pipelines while guaranteeing security and integrity. My contribution to the project is notable; recently, I created the first publicly described computational storage device that runs eBPF.

## Experience



### PhD Fellow

IT-Universitetet i København

Aug 2020 - Present (2 years 6 months)

During my time as Research Assistant, I developed several professional relationships and contributed to research published at a top tier conference. This put me in an excellent spot to apply for a PhD position under the 4+4 programme, which were accepted.

My PhD is funded by the DAPHNE project, which is an EU research project for designing integrated data analysis pipelines for large-scale data management, HPC, and machine learning.



### Intern

Samsung Electronics

Feb 2020 - Present (3 years)

I initiated a collaborative research effort between the IT University of Copenhagen and Samsung Research. During the internship I worked with a testing-framework called CIJoe, and added several reproducibility and cross-compatibility features.



### Research Assistant

IT-Universitetet i København

Jul 2019 - Jul 2020 (1 year 1 month)

I assisted the research of the Open-Channel SSD technology with the Data-intensive Systems and Applications group at the Institute of Computer Science at the IT-University of Copenhagen. The position was in direct continuation of my bachelor's thesis "LSM-Tree on Open-Channel SSD". During this employment I attended and published a paper at the CIDR '20 conference.

NB: Due to regulatory reasons, the contractual position was "Student Worker". My responsibilities and duties, however, resembled that of a Research Assistant.

## **Student Developer**

### Siteimprove

Jul 2018 - Jul 2019 (1 year 1 month)

I was assigned as maintainer and developer of Alfa, which is an open and standards-based accessibility conformance testing engine used for testing websites built using HTML, CSS, and JavaScript against accessibility standards such as the Web Content Accessibility Guidelines (WCAG).

My responsibilities included the development of new features, as well as optimising and improving existing functionality.

The work environment was an extended version of kanban, to ease the collaboration with contributors of the open source repository. We were borrowing some aspects of the agile framework "Scrum".

## **Chief Executive Officer**

### Frax.dk Development

Aug 2012 - Feb 2019 (6 years 7 months)

I developed and maintained software for small companies as a hobby. This turned into a small consultancy firm called Frax.dk Development. Frax.dk Development also offered a small hosting service with around 15 customers at its highest. Having a company at age 16 gave me important and meaningful experience with running a company, submission of VAT reports as well as taking executive decisions.

## **Chief Executive Officer**

### Pendler

Sep 2017 - Jun 2018 (10 months)

Pendler was a company working with early warning of Danish commuters. During the company's short lifetime it operated a platform notifying customers about changes to public transportation. The platform typically reacted faster and notified affected travellers more quickly than the transportation company did. This project gave me valuable experience related to system architecture, quality control, system security as well as performance.

## **Lead Developer**

### Pairy

Sep 2016 - Jun 2018 (1 year 10 months)

I was in charge of developing, maintaining and extending our infrastructure. The position included working with the architecture of the platform, including selecting the technologies to be used. The technologies I worked with included Docker, Kubernetes, Apache, MySQL and Debian running multiple services written in PHP using the Laravel and Lumen frameworks.

I was leading the development of the Pairy SaaS platform as well.

Pairy makes it possible to synchronise orders, customers and products automatically from webshops to accounting programs / ERP-systems.



## **Web Developer**

Pandi Web

Aug 2016 - Jun 2018 (1 year 11 months)

I worked as a web developer on several different projects. I primarily worked in website design, were I typically assisted with backend optimization and extensions.

As of September 2016, I was permanently assigned to work at Pairy ApS.



## **Software Developer**

Bello (formerly Newsio)

Apr 2016 - Jul 2016 (4 months)

I was hired as a full-time NodeJS backend developer. I was working on extending their core software, which included maintaining their micro-services and creating unit tests.



## **Chief Technology Officer**

OPLEVO

Sep 2013 - Jun 2016 (2 years 10 months)

I was Chief Technology Officer (CTO) and lead programmer of the OPLEVO software, which was a social booking platform. I was in charge of overseeing product development, and structuring further development, acting as a link between the developers and the management.



## **Web Developer**

Pandi Web

Sep 2015 - Mar 2016 (7 months)

I worked as a web developer on several different projects. I primarily worked in website design, were I typically assisted with backend optimization and extensions.



## **Junior Software Pilot**

Trifork

Jan 2015 - Aug 2015 (8 months)

I was developing software for customers of Trifork. I primarily developed in Objective-C. I worked on BestRoom - a beacon based iOS app for booking meeting-rooms on the fly. I had the responsibility of testing the range and usability of the beacons, as well as creating the first mobile-to-beacon distance calculations.



## **Media Operator**

Arnsbo Media

Sep 2012 - Sep 2014 (2 years 1 month)

I was the producer of property showcase videos for the realtor chains home and EDC. I was using my competencies in communication to compose showcase-videos to visualise houses and apartments to customers. The job primarily consisted of writing the script for the professional speakers, cherry-picking images as well as choosing animations and effects. A video was about 2-3 minutes long and took 10-15 minutes to produce.



## **Chat moderator**

Amino

Jul 2012 - Aug 2014 (2 years 2 months)

I was observing the chat-room on the entrepreneur-service Amino. My job consisted of assuring that the entrepreneurs of Denmark had a secure environment to chat in real-time. The job required me to act as an example, assuring that everyone felt safe. I also had to mitigate unwanted situations rapidly.

## **Application Expert**

Berlingske Media

Jan 2011 - Apr 2013 (2 years 4 months)

I was hired to write technical articles and reviews for Berlingske's online section about apps. I wrote approximately two articles a month. The job was challenging and required knowledge about writing good and entertaining articles.



## **Cashier**

KIWI Danmark

Apr 2012 - Sep 2012 (6 months)

My responsibilities included operating the checkout desk and cleaning of the store. The job required adaptability as the hours could range from 6 AM to 22 PM. I was professional and service-minded as I worked directly with the supermarket's customers.



## **Deliverer**

FK Distribution A/S

Jul 2011 - Apr 2012 (10 months)

I was delivering advertisements and newspapers two times a week. This employment required a high level of responsibility and perseverance, as I had to perform in any weather consistently. It required physical strength as the weight of a single day of delivery could approach  $\frac{1}{4}$  to  $\frac{1}{2}$  of a tonne.

Number of households on my route: 236

## **Education**



### **IT-Universitetet i København**

Doctor of Philosophy - PhD, Computer Science

2020 - 2024



### **IT-Universitetet i København**

Master's degree, Computer Science

2019 - 2022

During my master's degree, the university presented me with many exciting and valuable aspects of computer science. The degree was with a specialisation in information security.

During the degree, I took several security-related courses. During these courses, I have pen-tested web services, verified cryptographic protocols such as ElGamal, cracked passwords on high-performance computers and much more. One of my security projects was published on the ADMS '20 workshop.

I studied the 2nd year of my master's part time as I was enrolled on a PhD under the 4+4 programme.



## **IT-Universitetet i København**

**Bachelor's degree, Software Development**

2016 - 2019

During my bachelor's degree, the university presented me with many exciting and valuable aspects of software development.

The courses at the university were teaching many different sides of software development. Some were very focused on the business perspective of software development and the importance of proper business- and project management. Other dug deep into the bare-bones of an operating system including learning assembly and designing my very own programming language and compiler.

During my degree, I worked on many different projects. Most notably a map of Denmark drawn from an OSM file as well as software to render 3D-imagery using raytracing.

I concluded the degree with a thesis in experimental data systems (Open-Channel SSDs) with professor Philippe Bonnet as the supervisor.



## **KVUC**

**GSK, Mathematics A**

2015 - 2015

Course in Mathematics level A.



## **AARUHS TECH**

**Technical High School (HTX), Information Technology and Communication**

2012 - 2015



## **Rønbækskolen**

**Elementary Education**

2002 - 2012