Curriculum Vitae for Alexander Fleischer

Personal information

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Born:	10.04.1991	Nationality:	Norwegian

Summary

In 2018, I received my master's thesis in computational physics. The objective of the thesis was building a C++ application for simulating quantum dots. My goal was to develop code that was up to par with industry standards and I focused on writing good, readable code with extensive testing. In addition to C++ I used Python for data analysis. As a developer, I've cultivated my Python skills, and I now have ten years of experience with Python. Since February 2018, I have been working on a project at the transit administration company Ruter.

Technical skills

Frameworks	Numpy, Flask, Armadillo, Google OR-tools, PyPDF, Reportlab, uWSGI, Pandas, Node/React, Unittest, MPI
Languages	Python, C, C++, PostgreSQL, Javascript, Java, MATLAB, Bash, PHP
Tools	Git, Vim editor, Unix, LaTeX, Docker

Education

2018	M.Sc. Computational Physics from the Department of Physics, University of Oslo. Title of thesis: "Monte Carlo Studies of Quantum Dots". Supervisor: Professor Morten Hjorth-Jensen.
2017	B.Sc. in Physics, University of Oslo.

Professional experience

2018–	Consultant at Expert Analytics
2015–2017	30
2013–2017	Course Leader at Forskerfabrikken Summer School
2013–2014	Private Tutor at Studenthjelp privatundervisning

Languages

English	Fluent
Norwegian	Mother tongue

Personal skills

Problem solving	Both my current project, previous work experience and my master thesis has taught me to work independently and assess the task at hand.
Programming	During my education, practically every subject involved some form of programming and I also enjoy recreational programming and scripting.
Quick learner	I like to learn, and do so quickly, in particular about programming and science.
Written communication	I like writing clear and concise texts. Everything from popular science to documenting code.

Extended descriptions of selected projects

Activity	Stop Poster Production System, Ruter As
Period	February 2018—March 2020
Role	Developer
Staffing	1 developer
Description	The "Stop Poster Production System" is Ruter's application for automated generation of production files (PDFs) for analogue transit information. Ruter governs over 8000 transit stops in Oslo and Viken. All of these stops require some level of information, and most of the stops do not have digital displays. Thus the need for automatic generation of production files, which were previously made manually. The applications main purpose is to generate stop posters containing timetables, maps, ticket information and so forth. This means keeping track of what kind of information should be displayed on the stop and what kind of infrastructure exists. I further developed and refactored the backend system and expanded the application to a self-service website for easily generating and distributing large quantities of stop posters at a time. In addition to the stop poster generation, I implemented automatic generation of other types of analogue information, like name signs. The backend is written in Python and the website was developed with the Python micro-framework Flask and hosted using Apache. I also implemented a system for automatically generating optimal distribution routes between stops using Google OR-tools and the Google maps API.
Tools	Python, Javascript, Flask, PostgreSQL, Apache, Google OR-Tools, Google Maps API, Entur API

Activity	RuterStopps, Ruter As
Period	January 2019—March 2020

Role	Developer/adviser
Staffing	3 developers, 1 team lead, 1 UX/UI designer
Description	RuterStopps is a content management system developed by Ruter. Its main purpose is to gather all data relevant to transit stops managed by Ruter from various sources and display it in a React web app. This includes everything from information about the transit routes that operate the stop, to detailed information about building projects, contracts and assets. In addition to some development (Node/React), I advised the team on the direction of the project, performed daily code review and contributed to sprint retrospects and planning. RuterStopps evolved out of my main project described above.
Tools	Javascript/Node, React, PostgreSQL, AWS, Jenkins, Python

Activity	Monte Carlo Studies of Quantum Dots
Staffing	2 researchers
Description	For my master thesis, I developed software for finding the ground state energies of quantum dots (fermions) using the variational Monte-Carlo method. The program handles different potential wells, like the single and double harmonic oscillator and the finite square well. Furthermore I solved the Schrödinger equation of the potential systems to obtain one-particle wavefunctions of the energy states. The resulting wavefunction was then written as a linear combination of simple harmonic oscillator basisfunctions which were used in the Monte-Carlo solver and compared against the results of the original Monte-Carlo simulations. The code was primarily C++ with some data analysis in Python. I put effort and focus on unit testing and writing clean code.
Tools	C++, Python, Armadillo, MPI, Numpy