Curriculum Vitae for Vinzenz Gregor Eck

Personal information

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Born:	21.09.1987	Nationality:	Norwegian

Summary

I am a curious, pragmatic, creative problem solver. I hold a PhD in biomechanical engineering, focusing on stochastic simulations of the blood flow in the human arterial system. This inter-disciplinary work included working within engineering, medicine, biology, software development and statistics. My educational background is in mechanical engineering, with focus on numerical methods and bio-materials. Beside my studies, I worked in several different fields such as virtual commissioning, petroleum research, biomechanics research. My educational and work experience gave me strong analytic skills, the ability to see problems from different angles and strengthened my communications skills. In the last years I was mainly programming in Python, which I have used to write a comprehensive simulation software. I am also familiar with other languages, like C and C++, and can easily adapt beyond this.

Technical skills

Frameworks	GTK, Matplotlib, NumPy, SciPy, VTK, Mayavi, OpenGl, OSG, Chaospy, Sphinx, DOT, GraphViz, Bokeh
Languages	Python, C, C++, LaTeX, MATLAB, XML, Yaml, Json
Tools	Git, Subversion, Linux, Eclipse, PyCharm, VirtualBox, Inkscape

Education

2016	Ph.D. in Biomechanics from the Institute of Structural Engineering, Norwegian University of Science and Technology, Trondheim. Title of dissertation: "Uncertainty quantification and sensitivity analysis for cardiovascular applications". Supervisor: Leif Rune Hellevik
2013	Diplom Engineer in mechanical engineering, Technische Universität München, Germany.
2012	Master of Science in Technology, Norwegian University of Science and Technology, Trondheim, Norway. Conducted within the Double Degree Program T.I.M.E. (Top Industrial Manager for Europe). Title of thesis: "Arterial Flow and Pulse Wave Propagation in one dimensional Arterial Networks with Statistically Distributed Model Parameters". Supervisor: Leif Rune Hellevik

Professional experience

2016 –	Consultant at Expert Analytics
2012 – 2013	Ph.D. student at the Department of Structural Engineering, NTNU, Trondheim.
2013 – 2012	20% Department Engineer at the Department of Circulation and Medical Imaging, Faculty of medicine, NTNU, Trondheim. Development of a hemodynamic-simulation tool for one-dimensional arterial networks.
2012 – 2012	Teaching Assistant at the Department of Energy and Process Engineering, NTNU, Trondheim. Elaboration of fluid mechanic exercise in Matlab for master studies in engineering at NTNU.
2011 – 2012	Assistant Researcher at the Department for Petroleum Engineering and Applied Geophysics, NTNU, Trondheim. Set up and conduction of core-flooding experiments under high pressure, to determine the distribution of Oil, Water and CO2 on a micro scale within a stone sample.
2007 – 2010	Assistant Researcher at the iwb – Institute for Machine Tools and Industrial Management, TUM, Munich. Programming a simulation software of material flow based on physical laws for the virtual commissioning of production systems.

Languages

English	Fluent
French	Basic
German	Mother tongue
Norwegian	Fluent

Personal skills

Communications	I am proficient in presenting difficult contents understandably and in communicating within the context of interdisciplinary and international teams.
Management	I am experienced in motivating and leading small groups and planning projects.
Problem solving	I like solving problems with my analytic mind and my ability to plan projects combined with knowledge in engineering and programming.

Some interests and hobbies

Music	Guitar, Bass, Clarinet, Percussion, Music production (recording, mixing and mastering)
Physical	Hiking, Dancing

Extended descriptions of selected projects

Activity	Statkraft - Longterm Power Management - Visualization
Role	Main developer
Staffing	1 developer
Description	In Statkraft, Longterm Power Management is based on numerical simulations of complex water way systems, including reservoirs, power stations, and pumps. For the analysis and usage of these simulation results, visualization tools are needed. All results are visualized via web services based on Bokeh to present the data in a convenient and accessible manner. For a fast understanding of the topology of the simulated water way systems, a schematic map is needed. The project goal is to implement a visualization module to auto-generate layout and interactive web visualization of arbitrary water way systems at run time.
Tools	Python, DOT, GraphViz, Boukeh, NumPy, XML, Yaml, Json

Activity	The Planck Legacy Archive Added Value Interface (European Space Agency)
Role	Profiling of the system performance
Staffing	5 developers
Description	The Planck Legacy Archive is a website aimed at giving the general public the opportunity to access and use data from the ESA Planck satellite. In 2015 ESA started work on implementing an Added Value Interface to this website, which aims to allow users to manipulate and analyse data online before downloading, using various data cleaning and analysis techniques. My role in this project is to profile the memory usage of all analysis and map manipulations algorithms. This knowledge is used to control the size of the asynchronous workers spawned on all virtual machines. As consequence, all user requests are handled in the most efficient way.
Tools	Python, Docker, ANOVA

Activity	STARFiSh - stochastic arterial flow simulation
Role	Main developer and researcher
Staffing	1-2 researchers
Description	STARFiSh is an open-source simulation program to simulate blood flow in arterial networks with stochastic input parameters. The software combines an advanced one-dimensional fluid-structure-interaction code with methods for uncertainty quantification and sensitivity analysis. I wrote the software as part of my Ph.D. thesis.
Tools	Python, XML, Sphinx, NumPy, SciPy, GTK, OpenGl, ChaosPy, DOT

Activity	ve3 - virtual commissioning software
Role	software developer
Staffing	2 software developers
Description	Realtime simulation software for the virtual commissioning of production systems, simulating the material flow based on physical laws. I was working manly with refactoring in addition to adding new features such as fluids based on smoothed-particle hydrodynamics and flexible machine parts and process goods.
Tools	c++, XML, OSG, 3dMax, NVIDIA PhysX, NVIDIA Cuda