Sebastian Klaassen

Resume

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Summary

Software Development Engineer II at Amazon Web Services (graduated with BSc in computer science in Jan. 2014), currently working on Predictive Scaling for the AWS Autoscaling service, proactively scaling cloud instances, such as DynamoDB instances and Lambda capacity units, for AWS using AWS SageMaker deep learning models at Amazon Web Services.
As a staff engineer at Oak Ridge National Laboratory, USA, secured grant funding for the ES department as principle investigator, analyzing the effects of climate change on plant growth by tracing root formations using deep learning with TensorFlow.
Best machine learning solution award for most accurate method for data mining atomically resolved images for material properties using iterative search and refinement at SMC Conference in USA 2017.
Experienced in the fields of **machine learning**, **parallel programming models**, **heterogeneous computing**, **computer graphics** and **data visualization**. Skilled in **C++** (15 years), **C#** (13 years) and **Python** (9 years) .

Work experience

since 03.2020 **Software Development Engineer II**, *Amazon Web Services*,
`https://aws.amazon.com/`, Vancouver, Canada.
Providing on-demand resource allocation for AWS web services to optimize cost and availability through AWS Application Auto Scaling.

04.2018–12.2019 **Staff Engineer (Senior Software Engineer)**, *Oak Ridge National Lab*,
`https://ornl.gov/`, Oak Ridge, TN.
1) Development of a RESTful web service for MODIS, VIIRS and Daymet data products, serving over 12 million request since its initial release in 2018.
2) Automatic detection of roots in minirhizotron images using fully convolutional deep learning networks with TensorFlow.
3) Development of a unified DevOps framework for running and monitoring utility scripts at the NASA ORNL Distributed Active Archive Center for Biogeochemical Dynamics.

03.2017–09.2017 **Contract Engineer**, *Allen Institute for Cell Science*,
`http://www.allencell.org/`, (Remote work).
Development of a successor to the Interactive Plotting tool on the Allen Cell web page to ensure interactivity as more cells are added to the dataset. The programmed WebGL based scatter plot outperforms existing client side charting software, by interactively rendering datasets of over a million cells.

05.2015–02.2016 **Research Intern**, *Los Alamos National Lab*,
`http://lanl.gov/`, Los Alamos, NM.
1) Development of a data analysis tool for in-situ exploration of large scale image databases. The implemented image viewer allows exploration of image datasets in excess of available graphic memory, by streaming images to the GPU asynchronously.
2) Development of an application for interactively designing color maps. The tool gives scientists unprecedented insight into their data by enabling a novel form of data exploration through interactive changes to the colormap.

04.2014–04.2015 **Research Assistant**, *University of Vienna - Research group Visualization and Data Analysis*,
`http://cs.univie.ac.at/vda`, Vienna, Austria.
Implementation of a novel ray tracing algorithm.

08.2007 and 08.2008 **Intern**, *International Institute for Applied Systems Analysis*,
`http://www.iiasa.ac.at`, Laxenburg, Austria.
1) Preparation of environmental data for database upload.
2) Integration of the JasperReports library into the web interface.

Awards

2020 **AWS EC2 Hackathon**, **Best Overall**.
Autoscaling Visualizer

2017 **SMC Data Challenge 2017**, *Smokey Mountain Computational Science and Engineering Conference*, `https://smc-datachallenge.ornl.gov/2017/`, **Best Solution**.
Data mining atomically resolved images for material properties

2009 **ARGE 3D-CAD Competition**, `http://www.3d-cad.at`, **1st Place**.
3D model and animation of the thesis *Automated Guided Vehicle*

2004 **ARGE 3D-CAD Competition**, `http://www.3d-cad.at`, **2nd Place**.
3D model and animation of a recreational vehicle

Publications

10.2018 **A platform for retrieval, analysis, and visualization of MODIS & VIIRS land products**, *Shrestha R., Boyer A.G., Vannan S., Klaassen S., McNelis J.J., Thornton M.M., Wilson B.E.*, October 2018 VIIRS/MODIS Science Team Meeting Poster.

01.2018 **ColorMoves: Real-time Interactive Colormap Construction for Scientific Visualization**, *Samsel F., Klaassen S. and Rogers D.H.*, IEEE computer graphics and applications, IEEE Computer Graphics and Applications, 38(1), pp.20-29.

10.2017 **Scalability of Modern Scatterplot Visualizations for Large Image Datasets**, *Klaassen S.*, Master's thesis.

08.2017 **Data Mining Atomically Resolved Images for Material Properties**, *Klaassen S.*, 2017 Smokey Mountain Computational Science and Engineering Conference Poster.

06.2016 **Solving Communication-Intensive Problems Efficiently Using On-Chip Mesh Interconnection Networks**, *Klaassen S.*, 2016 ISC HPC Conference Research Poster.

05.2016 **Interactive colormapping: Enabling multiple data range and detailed views of ocean salinity**, *Samsel F., Klaassen S., Petersen M., Turton T.L., Abram G., Rogers D.H. and Ahrens J.*, In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 700-709). ACM.

06.2013 **Solving Communication-Intensive Problems Efficiently Using On-Chip Mesh Interconnection Networks**, *Bachelor's Thesis*.

Education

03.2014–10.2017 **MSc in Computer Science - Media Informatics**, *University of Vienna*, Vienna.
with distinction

03.2011–01.2014 **BSc in Computer Science - Scientific Computing**, *University of Vienna*, Vienna.

06.2009 **Graduation from Technical High School - Mechatronics**, *Höhere Technische Bundeslehranstalt Wien 10*, Vienna, *with distinction*.

10.2012–11.2012 **CS188.1x Artificial Intelligence**, *BerkleyX*, `https://www.edx.org`.
with distinction

Open Source Contributions

2021 **minc**, `https://github.com/RcSepp/minc`.
A multi-language compiler framework that integrates multiple programming languages by importing them like packages.

2018 **asyncframes**, `https://github.com/RcSepp/asyncframes`.
A concurrency-by-default programming model based on hierarchical coroutines for scalable parallel programming in Python.

2017 **ExaPlot**, `https://github.com/RcSepp/GlobalView.js`.
A JavaScript library for rendering scatterplots of very large datasets using WebGL.

Computer skills

Languages	C++, C, C#, Python, Java, Visual Basic, JavaScript, Ruby, NASM, Matlab, R, Perl
Graphics	Direct3D, OpenGL, WebGL, Vulkan, Ray Tracing
Web & Data	AWS, Python Flask, D3.js, SQL, NoSQL
DevOps	GIT, GitLab CI/CD, Docker, Travis CI, Coveralls
Libraries	STL, Boost, TensorFlow, Qt, MPI, OpenMP, BLAS, LAPACK, CUDA, LLVM
Cloud	AWS Lambda, AWS DynamoDB, AWS CloudFormation, AWS SageMaker, ...