

Mechanical engineer, expert designer and analyst with 13 years of experience in a broad range of industries. Dual US-Australian citizen with international experience in the US, Australia and Germany. Native English speaker, fluent in German.

Experience

Feb 2019 – Feb 2021

ThyssenKrupp Marine Systems GmbH

Kiel, Germany

Senior Structural Analyst

- Design and analysis of submarine structure and subsystems using ANSYS Workbench
- Nonlinear analysis of complex multibody assemblies with > 1000 parts and hundreds of fasteners
- Introduction of advanced topology optimization techniques into the current CAE workflow
- Lead analyst for in-house 3D printing expertise
- CFD analysis and optimization of internal multiphase flows (patent pending related to fuel cell technology)
- Automation and extension of analyses via novel Python software development (ACT + APDL)
- Significant marine design experience
- Direct customer interfacing
- Active German security clearance

Dec 2017 – Jan 2019

Vossloh Locomotives GmbH

Kiel, Germany

Preliminary Design Engineer

- Creation and styling of the next generation of locomotive concepts for the world market
- Preliminary structural and CFD analysis of locomotive prototypes
- Layout of structure including interdisciplinary systems integration and rapid prototyping
- Development of software to analyse and optimize hybrid train performance along difficult routes
- Development of hybrid (battery-diesel) and dual-mode (pantograph-diesel) system for future locomotive concepts
- Production of promotional material including 3D renderings and customized performance metrics
- Interfacing with customers and suppliers including detailed specification of system requirements

Dec 2015 – Nov 2017

Orange Engineering GmbH

Kiel, Germany

Senior Structural Analyst

- Contract work for [Vossloh Locomotives](#), [Oerlicon Neumag](#) and [Weihe](#)
- Design and analysis of locomotive structure using Inventor and FEMAP/NX-NASTRAN
- Analysis according to several European standards including DIN EN 12663, DVS 1612/1608, VDI 2230
- Manual calculation of structural details, fasteners and wearing elements
- Development of Python and Excel VBA tools to streamline analysis and locomotive data management
- MIG welding experience
- Optimization of non-Newtonian internal fluid flows using Fluent
- Parametric design and analysis of plastics equipment and exhaust systems with SolidWorks

Aug 2009 – Aug 2014

Strand7 Software

Sydney, Australia

Stress Analyst

- FEA consulting, software development and testing, customer training and support
- Detailed working knowledge of all solution types, including linear, nonlinear, static, dynamic, buckling, steady-state and transient thermal, natural frequency, spectral and harmonic response and fatigue
- Developed fatigue analysis tools and methods to standards DNV-CP-R203, PD 5500 and EN-1993-1-9
- Led teams of analysts in large consulting jobs from the mining, civil/structural, oil and gas and heavy industries, including analysis cost estimation and professional quotation
- Design of offshore equipment using Inventor
- Experience in the Civil Engineering sector, including transient seismic, geotechnical and staged construction analysis

May 2007 – Feb 2009

The Boeing Company – Phantom Works

Seattle, WA

Advanced Structural Analyst Level II

- Participation in 25 commercial and military projects, which led to three US patents (one pending)
- Nonlinear FEA including material characterization, interpretation of strain and correlation of test results with ABAQUS, LS-Dyna, Hypermesh, NASTRAN/PATRAN and CATIA V5
- Aircraft and rotorcraft crashworthiness analysis with explicit dynamics and composite crush
- Experience with composites: co-cured, bonded, stitched (design, manufacturing and testing)
- Optimization of aircraft and ground-vehicle structure for weight and strength with Optistruct and LS-OPT
- Use of CATIA V5 for technical drawing (2D and 3D) for aircraft and ground-vehicle design
- Organization of lab tests, including test rig design, strain gauge placement and test plans

USPTO Publication**Title**[US9001121 B2](#)

Method and apparatus for generating data for three-dimensional models from x-rays

[US8434293 B2](#)

High stiffness shape memory alloy actuated aerostructure

[US20110039057 A1](#)

Laminated composite rod and fabrication method (pending)

Apr – Jun 2006

The Boeing Company – Phantom Works

Seattle, WA

Mechanical Engineering Internship

- Development of whole-aircraft 3D relational design data sets with CATIA V5 and ENOVIA PLM
- Cooperated with experienced designers, manufacturers and analysts to develop optimized data sets including multi-resolution relational 3D models

Jan – Jun 2005

Honda R&D Americas – Motorcycle Division

Marysville, OH

Mechanical Engineering Internship

- Development and optimization of high-volume plastic and sheet metal ATV parts including cost analysis and logistics
- Investigation and documentation of test damage to plastic and metal parts
- Creation of 3D models and 2D drawings in CATIA V4 and V5
- Creation of design tools based on FEA results to simplify future performance predictions

Apr – Aug 2003

TASUS Corporation

Bloomington, IN

Plastic Injection Moulding Technician

- Responsible for the production of plastic injection moulded parts and value-added steps on the factory floor
- Trimming/finishing, quality assurance and light mould maintenance
- Produced parts for Honda, Suzuki, Ford, GM, Toyota and BMW
- Experience with high-volume automated manufacturing systems (robots, image analysis, conveyor systems)

Education

2002 – 2006

Purdue University

West Lafayette, IN

- BS Mechanical Engineering – GPA 3.77 (94%) <https://kkava.com/CV.pdf>
- Senior design submarine project <https://kkava.com/sub>
- Research and development of discrete element methods (DEM) with arbitrary boundaries <https://kkava.com/dem>
- Focus on numerical methods and simulation <https://kkava.com/st>

Computer Experience

- FEA: ANSYS Workbench⁺, FEMAP/NX-NASTRAN⁺, ABAQUS⁺, Strand7⁺, Fluent⁺, LS-Dyna, Optistruct, PATRAN/NASTRAN
 - Programming: Java⁺, VBA⁺, HTML/CSS⁺, Python⁺, PHP⁺, C/C++, Delphi, JavaScript
 - CAD: CATIA V5⁺ (and V4), Autodesk Inventor⁺, SolidWorks⁺, SpaceClaim⁺, ENOVIA PLM, Mastercam
 - Math: MATLAB⁺, LabView, Mathematica
 - 3D Printing: Repetier-Host, Slic3r, Cura, IdeaMaker, in PP, PET, TPU and PLA materials, Prusa i3x
 - General: PC⁺, MS-Office⁺, Linux/Unix, Mac, hardware, networking, printing
- ⁺ Strongest skills

Recent Personal Portfolio

- Snow Plow Design by analysis of snowplough clouding <https://kkava.com/snow/>
- SickSpreader Novel COVID-19 epidemiological model (python) <https://kkava.com/sickspreader/>
- Coffee Grinder Design of a new kind of coffee grinder <https://kkava.com/coffeegrinder/>
- Bike Repair Lots of 3D printing for my bike, + analysis <https://kkava.com/bike/>
- Covid Mask Direct-on-fabric 3D printed mask <https://kkava.com/mask/>
- Pumpy Radial-flow mini-turbines experimentation <https://kkava.com/pumpy/>
- Dice Sword Design of an injection-moulded sword to hold dice <https://kkava.com/sword/>
- Toys A few toys I've made for the kids <https://kkava.com/toys/>