

Kava Crosson-Elturan

Mechanical Engineer

Purpose Mechanical Engineer looking for project based engineering work in the Sydney area. I hold a subclass 574 visa which allows for unrestricted work in Australia until 31 May 2013 (4 years). Native US citizen.

Jul 2009 – Present **Strand7 Pty Ltd** Sydney, NSW, AU

Development and Support Engineer

- FEA software development and support
- Sparse linear systems algorithm development
- Software reliability and accuracy testing
- Customer support including phone, e-mail, one-on-one and group training
- Large scale consulting including forensic analysis of failed structure and standards compliance analysis
- Development of optimisation algorithms using the Strand7 API

May 2007 – Feb 2009 **The Boeing Company – Phantom Works** Seattle, WA

Advanced Structural Analyst Level II

- Experience**
- Worked on 25 projects at Boeing (both commercial and defense) leading to 3 pending US patents
 - Performed nonlinear Finite Element Analysis (FEA) including material characterisation, interpretation of loading and results and correlation to test data using Abaqus, LS-Dyna, Hypermesh / Hyperworks, Nastran / Patran and CATIA V5
 - Aircraft and rotorcraft crashworthiness analysis including explicit dynamics and composite crush
 - Experience with co-cured, co-bonded and bonded composite design, processing and testing
 - Optimised aircraft and vehicle structure for weight and performance using Optistruct and LS-Opt
 - Identified key structural and thermal failure modes in aircraft structure (airframe & main landing gear) and explored alternative designs
 - Used CATIA V5 to create engineering drawings and design aircraft and vehicle 3D geometry
 - Developed novel analysis solutions coding in Matlab and Python for interface to Abaqus
 - Led lab testing efforts to correlate FEA work to test data including strain gauge records, load and deflection
 - Organised lab testing including design of test equipment and layouts, strain gauge placement and test plans
 - Reported weekly and major findings to involved parties including stand-up presentations to over 10 people and detailed technical reports
 - Presented at an enterprise level conference on interesting findings
 - Project management including cost estimation and time management of up to 5 concurrent projects lasting from a few days to over a year
 - Promoted to Level II engineer in less than 2 years
 - Patents pending for 3D scanning methods and tools, morphing structure and novel composites (USPTO publications 20090128557, 20110039057 and 20110030380)

Apr - Jun 2006 **The Boeing Company – Phantom Works** Seattle, WA

Mechanical Engineering Internship

- Developed a large aircraft 3D geometry relational dataset using CATIA V5 and ENOVIA product lifecycle management tools
- Reported results and interfaced with designers, manufacturers and analysts to determine optimal dataset design and deployment including multi-resolution 3D model maturation
- This work was highly independent and resulted in continuing employment with Boeing through my last school term

Experience ctd.

Jan - Jun 2005 **Honda R&D Americas – Motorcycle Division** Marysville, OH
 Mechanical Engineering Co-Op

- Designed and optimised plastic and sheet metal ATV parts including cost analysis
- Investigated and documented plastic and welded metal structural failures
- Designed plastic snap-fits for user interface using FEA to predict release loads
- Created engineering drawings and revisions in CATIA V4 to reflect design changes
- Migrated existing CATIA V4 methods into more modern V5 implementations
- Created and managed whole-vehicle parts change lists
- Created 3D models from 2D drawings in CATIA V4 and V5
- Designed packing and calculated international shipping and packing costs for parts processing
- Created analysis spreadsheets for future use
- Guided testing efforts using FEA predictions

Apr - Aug 2003 **TASUS Corporation** Bloomington, IN
 Plastics Injection Moulding Technician

- Responsible for the production of plastic injection moulded parts on the factory floor
- Responsibilities included part trimming, QA inspection, mould maintenance and cleaning
- Made parts for Honda, Suzuki, Ford, GM, Toyota and others

Nov 2000 - Nov 2001 **University Information Technology Services** Bloomington, IN
 Computer Consultant

- Responsible for general management of computing facilities at Indiana University
- Assisted users with any questions related to computing, networking or printing
- Questions were general, ranging from email to programming and computer graphics
- Reported and troubleshoot hardware and software errors and outages
- Ensured the general usability and tidiness of the computing labs

Education

2003–2006 **Purdue University** West Lafayette, IN

- Mechanical Engineering, graduated with **GPA 3.77 (94.25%)**
- Senior design project submarine: <http://kkava.com/sub>
- Discrete Element Modelling (DEM) dynamics programming undergraduate research - C++ solution
 - Created collision detection algorithm between granular flow and arbitrary triangulated boundary
 - Previous DEM work: <http://kkava.com/java/springthing>

2002–2003 **Indiana University Purdue University Indianapolis** Indianapolis, IN

- Majoring in Mechanical Engineering with **GPA 4.0+ (100%)**

1999, 2001 **Indiana University** Bloomington, IN

- Majoring in Computer Science with **GPA 3.82 (95.5%)**
- Spanish fluency, intermediate Japanese

Computer Experience

- CAD: CATIA V4 and V5, ENOVIA PLM, SolidWorks, AutoDesk Inventor, Mastercam and Pro/ENGINEER
- Maths: MATLAB, LabView, and Mathematica
- FEA: Abaqus, LS-Dyna, Optistruct, ANSYS, Fluent, Nastran/Patran and Strand7
- Programming: C/C++, Java, BASIC family, HTML, Python, Perl and Delphi
- General: PC, Unix, cluster (MPI and SMP), Mac, printing and hardware experience

Other Skills

- Mastercam / CNC Mill / Lathe / Vertical Mill experience
- SCUBA certified, avid diver (over 100 logged dives)
- GFRP / CFRP composite construction
- Mechanical / Engine rebuild experience
- Welding (MIG) repair and fabrication
- Framing, roofing, finishing and general construction skills

Interests

- Simulation
- Mechanics / Engines
- Rail systems
- Motorcycles
- Submarines
- Java programming
- Aviation

Personal Website: <http://kkava.com>

Relevant Coursework

Course Name	Course Description
▪ Intro to C++ Programming	College course taken in high school. Developed real-time shooter game with event queuing.
▪ Intro Graphics for Manufacturing	CATIA V5 based 2D / 3D drafting.
▪ Multivariate calculus	Partial integration and differentiation.
▪ Linear Algebra and Diff Equations	First and second order ODE and linear systems.
▪ Diff Equations Including Systems	Higher order linear systems. ODE and PDE.
▪ Basic mechanics I and II	Statics and machine dynamics.
▪ Machine design I and II	Elements of machine design. Loading, simulation, gears, fasteners. Complete wind turbine transmission design.
▪ Thermodynamics I and II	Energy balance and thermo cycles for solid / fluid / gas. Solar panel thermal efficiency project.
▪ Linear Circuit Analysis I and II	RLC circuits. Analytical system response solutions.
▪ Mechanics of Materials	Solid mechanics. General loading response, beam theory etc.
▪ Structure and Properties of Materials	Broad range of materials considered. Metallics, Ceramics, Plastics.
▪ Finite Element Method Design & Opt	Mathematics and application of FEA methods. ANSYS based.
▪ Fluid mechanics	Static and dynamic fluid design.
▪ Heat and Mass Transfer	Advanced thermo. Conduction, convection and radiation. Analytical and finite difference solutions.
▪ System Modeling and Analysis	Controls and higher order systems analysis. Analytical and numerical solutions: http://kkava.com/java/springthing
▪ Principals of Turbomachinery	Axial and radial flow turbomachinery fluid dynamics. Multistage.
▪ DEM algorithm development	Independent research project to develop general contact algorithm.
▪ Numerical Methods in ME	Finite difference, finite element, numerical integration / differentiation
▪ Engineering Design	Senior year design project. RC submarine built: http://kkava.com/sub

For full coursework including results see <http://kkava.com/CV.pdf>