

Aaron A. Jutila

Summary of Qualifications

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| <ul style="list-style-type: none"> ▪ Design and Analysis of Aircraft Structures ▪ Certification Requirements of FAA CFR Part 23 and Part 25 Major Repairs and Major Alterations ▪ Fatigue and Damage Tolerance Analysis utilizing AFGROW ▪ Finite Element Analysis utilizing FEMAP/NASTRAN | <ul style="list-style-type: none"> ▪ Data Acquisition and Programming ▪ SolidWorks Design and Simulation ▪ GD&T, CNC and Manual Machining, Welding, Rapid Prototyping, FDM and SLA 3D Printing, and Sheet Metal Fabrication. ▪ Prototype Design and Fabrication |
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Experience

2017 to Present	SAFE Inc.	Monument, CO
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Junior Engineer

- Structural substantiation analysis in support of dimensional repairs utilizing supersonic particle deposition (SPD) on Boeing 767 aircraft.
 - Performed classical and finite element analysis (FEA) on aircraft access panels and other secondary structural components.
 - Used analysis to determine the worst case loading scenarios that could exist as the result of an SPD repair.
- Structural substantiation analyses in support of SPD repair to IAI KFIR C2 experimental aircraft.
 - Utilized CAD and state of the art coordinate measuring machine (CMM) outputs to generate accurate assembly models of main landing gear (MLG) components.
 - Utilized FEMAP/NASTRAN to generate 3D FEA assembly models representing real life loading conditions and component interfacing (e.g. bolt preloads, linear contact, etc.).
 - Results of FEA were used to write margins of safety and determine current fatigue life of existing and repaired parts.
- Analysis of KC-135 Teardown Failure Analysis Findings
 - Damage tolerance analysis including crack growth prediction.
 - Detailed structural modeling of sections of fuselage and wing using SolidWorks.
 - Development of FEA assembly models which use nodal displacements and rotations; taken at the vehicle level (i.e. complete aircraft), as enforced boundary conditions applied at the local level (i.e. particular section of aircraft requiring greater detail than vehicle level model can provide).
 - The FEA process includes integration of 1D line elements, 2D shell elements, and 3D solid elements in order to determine specific load distributions and localized stresses.
- Design of test fixtures to maintain compliance with ASTM standards.
- Lead Engineer in charge of review, release and configuration management of all company drawings.

2015 to 2017	3D Systems Inc.	Littleton, CO
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Healthcare Biomedical Engineer

- Focused on reconstructive surgery to the head and neck region of the human body.
- Use 3D CAD programs to simulate and plan hundreds of craniomaxillofacial reconstructive surgeries.
- As part of the Virtual Surgical Planning - Reconstruction Team, responsibilities included:
 - Case preparation and case planning, part design overview, quality control, final inspection of delivered parts and final case review/signoff.
 - Heavy exposure to Class I and II medical devices.

2013 to 2015	Aero-Flite Aerospace Group	Boulder, CO
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Aircraft Structures Engineer

- Worked with Structural FAA Designated Engineering Representative (DER).
- Tasked to develop repairs that maintain the strength/integrity of aircraft structures by analyzing and interpreting various types of engineering data.

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<ul style="list-style-type: none"> ▪ Evaluated and wrote Engineering Orders that provided step-by-step instructions on how to execute Major Repairs and Major Alterations on a variety of different aircraft and ensure compliance to FAA regulation. ▪ Aided in FAA certification projects, which include Supplemental Type Certificate and design changes. ▪ Work took place predominately on Part 23 aircraft with exposure to Part 25 airframe. <ul style="list-style-type: none"> ○ Work included: Stress analysis and damage tolerance analysis, prototype design, and sheet metal design. ○ In many cases forced to use creative problem solving skills within the confines of standard engineering practices due to onsite repair environment constraints. 		
2011 to 2013	Montana State University	Bozeman, MT
Graduate Research Assistant <ul style="list-style-type: none"> ▪ Research took place in Cellular Mechanotransduction and Osteoarthritis Laboratory, with topics focused on cartilage mechanics, mechanotransduction, and viscoelastic materials. ▪ Designed and built a PID controlled Bio Reactor (dynamic press) to apply well-defined (within 0.3 microns) mechanical loads to soft tissue samples in a sterile environment. ▪ Work has led to a greater understanding of physiological stiff hydrogel mechanics. 		
2011 to 2012	Montana State University	Bozeman, MT
Graduate Teaching Assistant <ul style="list-style-type: none"> ▪ Machine Shop Supervisor. <ul style="list-style-type: none"> ○ Responsibilities included: machine maintenance, student safety and shop cleanup. ▪ Aided senior capstone students in workpiece setup and CNC programing/ machining. 		
2011	Belcan Engineering Group	
Internship <ul style="list-style-type: none"> ▪ Responsibilities included: converting and updating mechanical drawings from Unigraphics (NX) format to a standard CATIA format. 		
2006 to 2011	Main Street Gym	Bozeman, MT
Boxing Coach <ul style="list-style-type: none"> ▪ Responsible for training men and women of all ages in the art of USA Amateur boxing including the physical and mental preparation of each boxer. ▪ Two years assistant to the owner, with two additional years as head trainer running the boxing club. 		
2007 to 2008	Advanced Electronic Designs	Bozeman, MT
Engineering Intern <ul style="list-style-type: none"> ▪ Worked with a team of electrical design engineers. ▪ Responsible for lab maintenance, product fabrication, and inventory. ▪ Set up and operated the firm's 3-axis CNC mill. 		
Education		
2013	Montana State University	Bozeman, MT
MS – Mechanical Engineering		
2011	Montana State University	Bozeman, MT
BS – Mechanical Engineering Technology		
Professional Affiliations		
EIT (Engineer in Training) 2003-2011 Bridger Clinic Peer Educators USA Boxing Coach Certificate, 2007 Provisional Patent filed with United States Patent and Trademark Office		

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Publications

Jutila, A. A., Zignego, D. L., Schell, W. J., June, R. K., 2014, Encapsulation of Chondrocytes in High-Stiffness Agarose Microenvironments for In Vitro Modeling of Osteoarthritis Mechanotransduction, *Ann Biomed Eng.*

Jutila, A. A., Zignego, D. L., Hwang, B. K., Hilmer, J. K., Hamerly, T., Minor, C. A., Walk, S. T., and June, R. K., 2014, Candidate mediators of chondrocyte mechanotransduction via targeted and untargeted metabolomic measurements: *Arch Biochem Biophys*, v. 545, p. 116-23.

Zignego, D. L., Jutila, A. A., Gelbke, M. K., Gannon, D. M., and June, R. K., 2014, The mechanical microenvironment of high concentration agarose for applying deformation to primary chondrocytes: *J Biomech*, v. 47, p. 2143-8.