todd.erickson87@gmail.com **Todd William Erickson** (206)-919-8795

EDUCATION

University of Southern California, Los Angeles, CA
MS, Computer Science, GPA 3.43 ..... **Expected December 2020**
University of Southern California, Los Angeles, CA
MS, Aerospace Engineering, GPA 3.40 ..... **May 2011**
University of Southern California, Los Angeles, CA
BS, Mechanical Engineering, Cum Laude, GPA 3.58 ..... **May 2010**

ACADEMIC EXPERIENCE AND COURSEWORK – COMPUTER SCIENCE (FULL TIME STUDENT)

- **Directed Research: Unified Code Count (UCC)-Java ..... Spring 2020**

Projects: Investigate and implemented GitLab's CI/CD for a Java project using a custom .yml file and Apache Maven.

- **Foundations of Artificial Intelligence ..... Spring 2020**

Coursework: Search, constraint satisfaction, logic, knowledge representation, planning, games, learning, neural networks, reasoning under uncertainty, probabilistic decision making, reasoning over time, reinforcement learning.
Projects: Implemented a search agent using BFS, UCS, and A* in a multi-level 2d grid-world with C++. **|** Created a Little-Go (5x5) AI Go playing agent implementing Monte Carlo and Minimax search with C++. **|** Created a MLP artificial neural network and use it to classify hand-written digits (0-9) from the MNIST database using softmax and cross-entropy loss in C++ (No ML libraries)

- **Web Technologies ..... Spring 2020**

Coursework: HTML, CSS, HTTP, HTTP/2, Web Servers, Javascript, Angular.js, Node.js, AJAX, JSON, PHP, REST, Web security and privacy tools, Mobile web technologies (Android and iOS), Cloud computing, Cloud functions
Projects: Simple Web Page Using CSS **|** JSON File Parser (enter buildinglist.json) **|** Azure cloud news aggregation webapp with Javascript, CSS, HTML, and a Flask & Python back-end to make RESTful calls **|** Azure cloud news aggregation webapp with a React.js/React-Bootstrap front-end and a separate Node.js back-end | Created a full stack Android news aggregation app

- **Analysis of Algorithms ..... Fall 2019**

Coursework: Analysis and design of greedy, divide and conquer, dynamic programming, network flow, and approximation algorithms. Asymptotic notation and time complexity analysis. NP-completeness.

- **Database Systems ..... Fall 2019**

Coursework: Data modeling, relational models, ER/EER diagrams, SQL, transactions, distributed DBs, business intelligence, spatial DBs, NoSQL, big data, MapReduce, data science, data mining, machine learning, data visualization and governance.
Projects: Created and queried a database in PostgreSQL V12. **|** Created a PostgreSQL V12 spatial database, performed queries including convex hull, and visualized using Google Earth using a kml file. **|** Created and queried a graph database using TinkerPop Gremlin. **|** Using Google Colab with a Jupyter Notebook, trained a neural network to classify cat and dog images.

- **Operating Systems ..... Summer 2019**

Coursework: OS History, threads, scheduling, I/O, storage allocation, static and dynamic linking and loading, interrupts, virtual/actual file systems, virtual memory, directories and naming, file system journaling, flash memory, virtual machines, microkernels.
Projects: In Ubuntu 16.04 32bit in C: Created a circular doubly linked list from scratch. **|** Created a multi-threaded token-bucket filter based traffic-shaper **|** Implemented much of the functionality of the weenix to display "Hello, World!" in the user space terminal.

- **Introduction to Computer Networks ..... Spring 2019**

Coursework: IP and physical addressing, OSI model, routing, socket programming, networking protocols, networking security.
Projects: In Ubuntu 16.04 32bit, created a TCP and UDP socket networking system of separate processes in C++.

- **Introduction to Programming Systems Design - Does not count toward GPA - Letter Grade: A- ..... Spring 2019**

Coursework: Programming and software design fundamentals, Big-O algorithm analysis, Unix/Linux, Java, C++.
Projects: **Java** - Coin toss simulator with result statistics GUI **|** Bulgarian solitaire solver from user input starting conditions **|** GUI based minesweeper **|** Scrabble word score calculator from a set of letters **|** **C++** - Created a hash table used for organizing student grades and for creating a word concordance from text files **|** Created singly linked list assessment and modification functions.

PROFESSIONAL EXPERIENCE

Boeing Commercial Airplanes, Propulsion Engineer, Fuel Systems Center of Excellence 2010-2020

Propulsion Engineer III 2017-2020
Propulsion Engineer II 2013-2017
Propulsion Engineer I 2011-2013
Propulsion Engineering Intern ..... Summer 2010

- **2018 Product Development Grand Challenges, Step change innovation for a future small aircraft (FSA) 2018**

Gathered and led a team for the application of novel technologies to the FSA. **|** After initial pitch competition, it was selected for further development. **|** Developed net present values, risks, potential mitigations, and future development plans.

- **Created updated tubing object and tubing object creation classes for use with updated interpreter 2018**

Using object inheritance, abstract classes, heterogeneous arrays, dependent properties, and events/listeners, created updated MATLAB classes for tubing elements and tubing runs and their respective creation and modification.

- **Improvement of ISO 10303-21 STEP File (.stp) interpreter for generating MATLAB tubing geometry 2017**

Researched and documented the ISO STEP file standards to understand STEP file structure and created in-house documentation. **|** Modified existing function-based interpreter to be class-based and to identify and capture previously missed geometry.

- **KC-46 aerial refueling system surge pressure model development with Simulink/Simscape 2017**
- **Risk reduction of 777X fuel tank flammability reduction system (FRS) Monte Carlo model 2017**
- **KC-46 aerial refueling system surge pressure model risk reduction with Simulink/Simscape..... 2017**

Used to enable certification. Optimized model to greatly improve the run time (5 min vs 60 min) vs older Easy5 based models.

- **Evaluation of flight dynamics effects on fuel tank flammability reduction system (FRS) using MATLAB and Simscape 2016**
- **Analysis and documentation of the vapor to liquid ratio (V/L) present in aircraft's fuel system 2010-2016**

Presented on the solubility of gases in aviation fuels to the Coordinating Research Council, Inc. (CRC). **|** Developed a web-based Air Solubility and V/L tool using HTML, CSS, JavaScript, and jQuery for use by internal customers. Created a based MATLAB tool using unit testing **|** Authored the updated section on air solubility in jet fuels in the CRC Handbook of Aviation Fuel Properties.

- **Evaluate Simulink/Simscape for analysis of fuel system transients (surge pressure) 2015**
- **2014 Product Development Grand Challenges, Configuration design for a family of novel commercial aircraft 2014**

Created a family of 7 single-aisle aircraft sized for 120-245 passengers with 80% part commonality, featuring novel wing shape and engine integration and a novel geodesic fuselage (5 patents). Resulting in 20% reduced fuel consumption and 30% faster fuselage production rate. **|** Expanded, refined, and optimized 2013 MATLAB analysis code for analyzing a family of aircraft.

- **Update Fuels Research group website 2014**

Recreated website using HTML, CSS, JavaScript, and jQuery to allow for improved usability and easing site maintenance.

- **Development of jet fuel vapor pressure estimation software in MATLAB and excel 2013-2014**
- **Support of reforming fuel cell development projects and development of fuel cell thermodynamic models 2010-2012**

PROFESSIONAL ACHIEVEMENTS

- **2013 Product Development Grand Challenges, Best Overall Innovation: Product Differentiation – 737 replacement..... 2013**

Implemented novel features for reducing contra-rotating fan noise and the integration of a large-fanned engine with a 30% reduced fuel burn (3 Patents). **|** Developed MATLAB functions for both estimating the design's cost of development and construction and to evaluate mission fuel burn as a function of cruise altitude and Mach number. **|** Preformed 3D CFD using ANSYS CFX with turbulence transition models to study the engine installation. **|** Created CAD geometry to allow for a 3D printed model of the engine.

- **2012 Product Development Grand Challenges, Bold Ingenuity: Inspired Visionary Creativity 2012**

Developed a firefighting artillery shell capable of launch from existing artillery guns to replace the costly use of aircraft (2 patents). Upon patent publication, the concept received worldwide media coverage. **|** Simulated wildfires using US Forest service methods to quantify the benefits of the system. **|** Performed hypersonic CFD analysis with ANSYS Fluent to build shell ballistic tables.

PATENTS

System and method for augmenting a primary powerplant	Pending	US 20180118364A1
Fire-retarding artillery shell	Granted	US 10429160B2
Laterally reinforced variable pitch rotor	Granted	US 10018058B2
Systems and methods for determining sizes and shapes of geodesic modules	Granted	US 9965582B2
Systems and methods for manufacturing a tubular structure	Granted	US 9957031B2
Integrated pusher turbofan for aircraft	Granted	US 9950800B2
Contra-rotating open fan propulsion system	Granted	US 9835093B2
Vibration dampening for horizontal stabilizers	Granted	US 9828084B2
Fire-retarding artillery shell	Granted	US 9816791B2
Geodesic structure forming systems and methods	Granted	US 9789548B2

SOFTWARE SKILLS

Programming: C , C++, Java, MATLAB, Python, Linux shell (bash), SQL (Postgres), JSON, Visual Studio Code, Maven **| Version Control:** Git, GitHub, GitLab, Bitbucket, Rabbit VCS, TortoiseGit, TortoiseSVN **| Web Development**: Node.js, React.js, Bootstrap, React-Bootstrap, Flask, HTML, CSS, JavaScript, jQuery **| Scientific Computing**: MATLAB, Simulink, Simscape, Easy5 **| Computer Aided Design**: Rhinoceros 3D, V-Ray, Solidworks, CATIA **| CFD**: ANSYS CFX, ANSYS Fluent, ANSYS ICEM CFD, SolidWorks Simulation

ACADEMIC AWARDS

USC DEN Scholarship..... **Spring, Fall 2019**

AIAA Undergraduate Team Aircraft Design Award, Egret **2009-2010**