

# Elliott Radcliffe

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- Bilbao, PV, España and Washington, DC, USA
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- <https://github.com/radcli14>

## Objective

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I'm a software (mobile, web) developer with a background in mechanical engineering and over 10 years of experience in aerospace R&D. My vision is to create applications that bridge the gap between physical hardware and digital simulation. Recent projects focus on creating AR-based human-machine interfaces, and using robotics simulation tools (URDF/MuJoCo) that enable professionals to visualize and test complex systems on mobile devices. I am seeking consulting, contracting, or freelance opportunities in an entrepreneurial or startup environment, where I can leverage my unique multidisciplinary skillsets in mechanical and software fields.

## Education

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### M.S. Mechanical Engineering, Michigan State University, 2010

- Specialization in dynamics and vibration
- Thesis: *Development of an Optical Feedback-Controlled Microphone for Aeroacoustics Research*

### B.S. Mechanical Engineering, Michigan State University, 2007

## Technical Skills and Miscellaneous

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- **Programming:** Swift, Kotlin, Python, JavaScript, C#, C++, Java, MATLAB, Mathematica, LabVIEW
- **Analysis:** NumPy, SciPy, SymPy, Pandas, matplotlib, TensorFlow, MuJoCo
- **App Development:** SwiftUI, Jetpack Compose, Kotlin Multiplatform
- **3-D Rendering:** Unity, Blender, RealityKit, Three.js, SceneKit, Google Filament, Three.js, OpenGL
- **Computer Aided Engineering:** Abaqus, Simulink, Simscape Multibody, SIMPACK
- **Office/Typesetting:** Microsoft Office, LaTeX
- **Awards:** NASA GSRP Fellowship (2008, 2009), Aegis Ballistic Missile Defense Excellence Award (2018)
- **Security Clearance:** SECRET, active from 2010-2023

## Experience

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### DCDC LLC, 2023 - Present

*Founder and Independent Software Developer*

- Provide mechanical, aerospace, and software engineering services to clients across industries, see: [dc-engineer.com](http://dc-engineer.com)
- Develop cross-platform mobile applications using Swift (iOS), Kotlin (Android), and Python, on the [App Store](#) and [Google Play](#)
- Create 3D and AR experiences for mobile devices, using RealityKit, ARKit, and Jetpack Compose, see: [AR Mobile Robotics](#)
- Build educational and applied tools for engineers, focusing on simulation, visualization, and user interactivity
- Client projects include:
  - A machine learning model in TensorFlow to estimate aerodynamic properties of race cars
  - AR-based measurement and object placement for a landscape design application
  - Multiplatform local area and remote networking for a custom Android device
  - A published hearing test and audiogram analysis app using SwiftUI and AVFoundation

## Johns Hopkins University Applied Physics Laboratory (APL), 2010 - 2023

*Dynamics Section Supervisor in the Aerospace and Mechanical Engineering Group (2017-2023)*

- Managed 7 professional staff with advanced engineering degrees and research expertise
- Navigated the COVID-19 pandemic with zero furloughs, layoffs, or resignations
- Pursued new business opportunities by building relationships with program management and sponsors
- Coached staff members through the definition and achievement of their personal career objectives

*Lead Engineer (2015-2016, 2020-2023)*

- Led hardware sustainment & reliability, trajectory simulation, and hardware-in-the-loop teams
- Received an award signed by an US Navy Admiral recognizing my contribution resulting in a \$100 million cost saving
- Briefed results of APL analyses to government and industry teams
- Authored documentation describing functionality of critical hardware subsystems

*Subject Matter Expert in Structural Dynamics, System Identification, and Propulsion Test & Evaluation*

- Developed modal analysis and digital signal processing algorithms in MATLAB and Python
- Created flexible airframe dynamics simulation models using finite element modeling and multibody dynamics software, including Abaqus and SimScape Multibody
- Championed aeroelasticity modeling as a core competency and growth area for the dynamics section

## Michigan State University Flow Physics and Control Laboratory, 2008 - 2010

*Research Assistant*

- Developed a feedback-controlled, self-calibrating microphone prototype for aeroacoustics research
- Implemented control system design techniques and evaluated optical displacement sensor technologies
- Published results in a peer reviewed journal article and received a US patent

## NASA Langley Research Center, 2008 - 2010

*Research Intern, Graduate Student Researchers Program (GSRP) Fellowship*

- Set up a laboratory test to replicate facility used at MSU for validation of microphone prototype concepts
- Collaborated with NASA experts in the fields of acoustical measurement and digital signal processing
- Presented findings to branch and GSRP peer groups

## Code Examples

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### BB25

- Interactive 3D/AR simulation of a differential drive robot using RealityKit
- High-fidelity physics simulation using MuJoCo
- <https://github.com/radcli14/BB25>

### YouKon

- Unit conversion app designed for engineers, written with Kotlin Compose Multiplatform
- Authentication and cloud storage using Firebase, and monetization using RevenueCat
- <https://github.com/radcli14/youkon>

### SwiftlyTwoLinks and KotlyOtlyDobleDosLinks

- Native iOS and Android apps using Swift and Kotlin to create an interactive double pendulum
- Physics-based 3D rendering using [SceneKit](#) and [SceneView](#)
- <https://github.com/radcli14/twolinks>

## Formal Communications

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### Journal Article

- E.J. Radcliffe, A.M. Naguib, W.M. Humphreys, “A Novel Design of a Feedback-Controlled Optical Microphone for Aeroacoustics Research,” *Measurement Science and Technology*, 21, 105208 (2010), <https://iopscience.iop.org/article/10.1088/0957-0233/21/10/105208>

### Patent

- E.J. Radcliffe, A.M. Naguib, W.M. Humphreys, “Acoustic Beam Forming Array Using Feedback-Controlled Microphones for Tuning and Self-Matching of Frequency Response,” US Patent 8,848,942, 30 September 2014, <https://ntrs.nasa.gov/api/citations/20150003428/downloads/20150003428.pdf>

### Conference Proceedings

- E.J. Radcliffe, D.P. Seker, E.Y. Chen, N.N. Horne, J.L. Hill, “Determination of a Predictive Model for Print Quality of Desktop 3D Printers While at Sea,” ASME International Design Engineering Technical Conference, Boston, MA, IDETC-CIE-112599, 20 August 2023, <https://doi.org/10.1115/DETC2023-112599>
- J.T. Melcher, E.J. Radcliffe, C.S. Butler, B.M. Wheaton, “Effects of Aeroelasticity on Flight Dynamics in the Boundary Layer Transition (BOLT) Experiment,” AIAA Aviation Forum, Chicago, IL, 29 June 2022, <https://arc.aiaa.org/doi/abs/10.2514/6.2022-3748>
- B.J. Olson, E.J. Radcliffe, R.J. Monroe, B.J. Vidmar, and R.A. Caldwell Jr., “An Inverse Force Identification Methodology for High-fidelity Dynamic Thrust Measurements of Guided Interceptor Missile Divert and Attitude Control Systems,” 17th U.S. National Congress on Theoretical & Applied Mechanics (East Lansing, Michigan), Abstract D-10-402, 2014
- R.N. Couch, E.J. Radcliffe, B.J. Olson, R.A. Caldwell Jr., and B.F. Feeny, “Modal Parameter Identification of a Missile Launcher Structure for Finite Element Model Correlation,” 17th U.S. National Congress on Theoretical & Applied Mechanics (East Lansing, Michigan), Abstract D-10-1180, 2014
- E.J. Radcliffe, A.M. Naguib, W.M. Humphreys, “Design and Characterization of an Optical Feedback Controlled Microphone for Aeroacoustics Research,” 62nd Annual Meeting of the APS Division of Fluid Dynamics, 54 (9), Minneapolis, MN. Nov. 22-24 (2009)