Ashwin Sundar

Senior Software Engineer	www.ashwinsundar.com
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B.S. in neuroscience from University of California, Los Angeles; M.S. in biomedical engineering from Arizona State University. Graduate Research Fellowship awarded by Dr. Leland Hartwell (2001 Nobel Laureate). DRM (Design for Six Sigma) Green Belt certified at Medtronic, 2018 Medtronic Beacon Award for outstanding engineering contributions, and recipient of internal trade patent at Medtronic.

Work Experience

DEPT (January 2022 - present) - Denver, CO

Technology consultancy based in Amsterdam, NL

- **Senior Software Engineer** (January 2023 - present)
- **Software Engineer III** (January 2022 - January 2023)

Client: U.S. Department of Energy (DOE) (Jan 2024 - Feb 2025)

- Web application for Grid Deployment Office
- **Tools used**: Typescript, React/Next.js, AWS, Postgres, Docker, git, GitHub Actions

Client: Major Terrestrial Communications Provider (Aug 2023 - Dec 2023)

- Satellite communications integration
- **Tools Used**: Go, AWS, Postgres, Docker, git, GitLab

Client: Medical Device Manufacturer (Aug 2021 - July 2023)

- Medical centrifuge (FDA Class I device)
- Embedded Linux (C++)
- Mentorship of junior engineers
- **Tools used**: C++, gdb, catch2, shell scripting, Linux Fedora, git

Client: Restaurant chain (Jan 2022 - Aug 2022)

- Full-stack web development for high-visibility business homepage
- **Tools used**: Gatsby/ReactJS, GraphQL, Azure DevOps, git

SND Logic (Nov 2023 - present)

Small business with a mission to make science better.

- **Co-founder, lead developer**
- **Tools used**: Django/Python, DigitalOcean
- Released a product called MouseHouse (in beta at Harvard)

Medtronic (Aug 2016 - Jan 2022)

Major medical device manufacturer

- **Software Engineer II** (Oct 2017 - Jan 2022) - Denver, CO
  - Full-stack web solution for requirements and risk management
  - Created and delivered requirements and risk management training to users in Colorado, Massachusetts, Florida, and Shanghai
  - Awarded 2018 Medtronic Beacon Award
  - Completed DRM Green Belt project - estimated business savings of $1.6 million per year
  - **Tools used**: Cognition Cockpit, Javascript/jQuery, HTML/CSS, ObjectStore, Tableau, SQL, R
- **Software Requirements Engineer** (May 2017 - Oct 2017) - Minneapolis, MN
  - Wrote software requirements describing heart monitoring system

- **Graduate Engineering Intern** (Aug 2016 - May 2017) - Phoenix, AZ
  - Implemented industrial statistics software tools, primarily around Design for Six Sigma
  - Awarded internal trade patent for healthcare analytics application
  - **Tools used**: SQL, Tableau, R, Subversion, Cognition Cockpit, Javascript/jQuery, HTML/CSS

ASU Biodesign Institute (Feb 2016 - Dec 2016)

Arizona State University

- **Graduate Research Fellow** (Feb 2016 - Dec 2016) - Tempe, AZ
  - La Belle Lab @ ASU. Stipend awarded by Nobel Laureate Dr. Leland Hartwell
  - Developed physiological sensing devices for human studies
  - Circuit board design, electrical testing, physical interface design, algorithm design

Education

B.S. Neuroscience - University of California, Los Angeles (2013)

M.S. Biomedical Engineering - Arizona State University (2016)

IDENTIFICATION OF CARDIAC ARRHYTHMIAS IN ELECTROCARDIOGRAPHY DATA USING EMPIRICAL MODE DECOMPOSITION

- **Advisors:** Dr. Jeff LaBelle, Dr. Mark Spano, Dr. Heather Ross
- **Abstract:** Electrocardiography (ECG) data is often subject to frequency domain techniques, such as Fourier and wavelet analysis, in order to deconstruct and understand the relationship between cardiac disease and electrical activity in the heart. However, ECG artifacts are typically brief, making frequency domain analysis challenging. An alternate method of analysis, empirical mode decomposition (EMD), may be more appropriate for analyzing short windows of data, since data analysis never leaves the time domain. EMD was applied to more than 2,000 ECG waveforms spanning a range of subjects and arrhythmia types from the MIT-BIH Arrhythmia Database. Physician annotations were used to window and sort waveforms, and EMD was used to deconstruct waveforms into intrinsic mode functions (IMF). An average IMF for each arrhythmia and the healthy ECG waveform was calculated. IMFs from each arrhythmia were then compared with IMFs from healthy ECG data. This comparison can be thought to represent a unique signature of each arrhythmia type.Electrocardiography

Independent Study

- Programming Languages, Part A (Coursera/U Wash)
- Accelerated Computer Science Fundamentals Specialization (Coursera/UIUC)
- Ultimate Rust 2 - Intermediate Concepts (Udemy)
- Rust Fundamentals (Pluralsight)
- HTML, CSS, and Javascript for Web Developers (Coursera)
- Introduction to UI Design (Coursera)
- Circuits and Electronics I: Basic Circuit Analysis (MIT OpenCourseware)
- Discrete Mathematical Structures (Mesa Community College, Grade: A)
- Calculus III (Mesa Community College, Grade: A)
- Linear Algebra (Mesa Community College, Grade: A)
- Differential Equations (Mesa Community College, Grade: A)

Awards and Certifications

- 2018 Medtronic Beacon Award
- DRM/DFSS Green Belt (Medtronic, 2018)
- 2017 Medtronic Internal Patent #A000****
- 1st place, Mesa Community College Math Contest (2014)