David Torres

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Summary

Hands-on technical leader with experience developing successful cloud-based services, machine learning/AI solutions, and data analytics and data processing systems. I specialize in productizing ML/AI and am passionate about delivering solutions to complicated technical problems.

Skills

- **Strengths**: Product Development, Technology Leadership, Data Engineering, Machine Learning/AI, Cloud Application Architecture, DevOps, MLOps, SaMD/Medical Devices, Product Security, Regulated Environments (HIPAA, SOX), IEC 62304
- **Technologies**: AWS, Azure, AI/ML, Big Data and LLM ecosystems, Docker, Kubernetes, Python, .NET, SQL, Cloud Web Development, Linux, Windows

Experience

- **Surgalign/HOLO Surgical** - AI Based Surgical and Medical Imaging Technologies — San Diego, CA
  Director of Software Development — *May 2022 - Present*
  Principal Software Architect — *Dec 2021 - May 2022*
  - Architected our multi-service cloud backend, allowing engineers to deploy multipole scalable AI products.
  - Oversaw the creation and production launch of a new deep-learning-based medical image analysis service, enabling company to venture into a new market segment. (See video.)
  - Drove the unification of cross-functional groups to build and standardize the company's MLOps practices and tools.
  - Collaborated with Data Engineering teams to initiate the adoption of Databricks, fulfilling the company's data lake and data analysis requirements.
  - Partnered with Product Security teams to formulate and implement robust security procedures, ensuring the integrity of our products.
  - Directed releases of our 510(k) cleared surgical navigation system (SaMD), overseeing improvements and enhancements after the company's initial launch.
  - Managed a global software team of 9 engineers working on multiple products and initiatives.
- **Smith + Nephew** - Digital Health Applications (Acquisition) — San Diego, CA
  Senior Software Architect — *Aug 2020 - Dec 2021*
  - Managed and directed the work of 13 engineers to deliver multiple releases across two medical/SaMD cloud-based products: A digital care management platform and a computer vision based physical therapy service.
  - Responsible for architectural design and oversight of cloud services, data systems, and major software features with a focus on scalable, maintainable solutions.
  - Performed hands-on management and nurturing of the software team: responsible for hiring, coaching, implementing agile based processes to improve team productivity and code quality.
  - Well versed in technical product management: collaborated with external stakeholders to solve problems using technical and non-technical means to bring value to the end user.
  - Performed hands on software development with an eye toward aleviating friction points in the development process. Implementation of automation and tooling to speed up developer productivity.
  - Key Projects: Relaunch of acquired software product. Cloud service lift & shift and data migration, EHR integration.
- **Reflexion Health** - Computer Vision Based Remote Physical Therapy — San Diego, CA
  Principal Software Engineer — *Jan 2019 - Aug 2020*
  Lead Software Engineer — *Mar 2017 - Jan 2019*
  - Managed a team of 11 engineers in the development of our HIPAA-regulated FDA-cleared teletherapy services. Responsible for web apps, backend services and data engineering. (See video1, video2)
  - Performed hands-on supervision of web app, backend and database development. Performed architecture, people management, technical project management, implementation and bug fixing. (C#, Rails, Go, TypeScript, React, MySQL, Docker, AWS, .NET Core)
  - Architected and project managed a 2-year long initiative to create a multi-tenant platform and migrate customer data. This led to a cost savings of over 65% compared to the legacy infrastructure and reduced the client on-boarding effort from a week to down to minutes.

- Oversaw the architecture and implementation of our data engineering pipelines and reporting services that were used to make informed, timely business decisions.
- Led the continuous improvement of the SDLC for my team by implementing containerized local development workflows, building automation and tooling, and driving agile-based process improvements such as Kanban, Sprints, Daily Scrum and metrics-based task management.

- **Signal Genetics** - A Molecular Diagnostics Biotech Leveraging High-Volume Data Analytics — Carlsbad, CA
  Principal Software Engineer — *Jan 2015 - Feb 2017*
  - Founded the company's software development and data engineering team, managing them to develop the infrastructure behind the core bioinformatics based product. This included a cloud-based microservice pipeline to process diagnostic test results and required integration with Illumina's genetic sequencing platforms.
  - Developed REST APIs to interface with vendor systems to automate the collection of operational telemetry.
  - Managed consultants and vendors to extend the company's Lab Information System.
  - Developed formal software control policies and procedures to conform to SOX and HIPAA.

- **Anssur Corp.** - Analytics and Software Development (Consulting, various companies) — San Diego, CA
  Software Engineer/Consultant — *July 2009 - Dec 2015*
  - Developed ML algorithms to detect traffic signs and traffic signals captured by camera-equipped field vehicles. (SVM trained on HoG features. Viola-Jones boosting.) Also developed custom software to collect labeled training data. (C#, XAML, R, OpenCV, EmguCV)
  - Developed software to control a minimally-invasive surgical robot. Implemented an event-based state-management framework to handle all sensor interactions (C++, Windows real-time OS, EtherCAT.) Also developed a TCP/UDP based presentation framework that interfaced robot with a tablet UI. (C#, XAML, MVVM)
  - Developed software for a specialized stethoscope used in telemedicine applications. The software streams PCM audio across the internet to a desktop client. Developed audio buffering algorithms for internet transmission, including quality-of-service detection and error-correction (packet loss concealment.) (C++, DirectSound API, MFC)
  - Full stack development of an analytics dashboard to visualize and analyze company-wide operational and sales data. (Adobe Flash/AIR, Apache Tomcat, Java, SQL Server)
  - Developed software to rapidly prototype and profile image processing algorithms. Implemented Otsu based thresholding to detect embryoid bodies in medical images. (C#)

- **Vision Robotics** - Computer Vision and Robotics Company — San Diego, CA
  Software Engineer — *Apr 2008 - Jun 2009*
  - Implemented stereo pair image 3D reconstruction algorithms for use in a robotic grapevine pruner. (Correlation based pixel matching methods and stereopsis.) (C++)
  - Developed algorithms for detecting, tracking and performing 3D reconstruction of grapevines across a time series of moving stereo pair images.
  - Implemented fast image interest point detection libraries (Harris and Moravec algorithms.)
  - Implemented object recognition methods for use in object detection. (SVM and kNN applied to SIFT features.)
  - Developed color-based fruit detection algorithms. (GMM analysis on RGB and HSV color spaces.)
  - (See video.)

- **University of California at San Diego** - Academic Research — San Diego, CA
  Graduate Research Assistant — *May 2006 - May 2009*
  - Researched unsupervised machine learning methods to recognize musically meaningful words from audio and text annotations. Implemented a novel algorithm, Sparse CCA. Used convex optimization packages SeDuMi, CVX, Mosek.
  - Developed a music auto-tagging and keyword search engine. GMM analysis of audio features and text using advanced EM methods (Mixture Hierarchies EM) to deal with large datasets.
  - Developed pipeline to perform feature extraction, train ML models and expose results on a web app (Java, PHP and MySQL)
  - Published several articles based on research.

Education

- **University of California at San Diego** — San Diego, CA
  Master's of Science in Computer Science : Machine Learning Program — *2004 – 2009*

- **University of Texas at Austin** — Austin, TX
  Bachelor's of Science in Computer Science — *1999 – 2004*

- **University of Texas at Austin** — Austin, TX
  Bachelor's of Science in Mathematics (Scientific Computation Program) — *1999 – 2004*

Publications

- **Using Sparse CCA for Vocabulary Selection.** Master's Thesis, Univ. of California at San Diego (2009).
- **Semantic Annotation and Retrieval of Music and Sound Effects.** IEEE Transactions on Audio, Speech and Language Processing, Volume: 16, Issue 2. Douglas Turnbull, Luke Barrington, David Torres and Gert Lanckriet (2008).
- **Finding Musically Meaningful Words by Sparse CCA.** Neural Information Processing Systems (NIPS) Workshop on Music, the Brain and Cognition. David Torres, Bharath K. Sriperumbudur and Gert Lanckriet (2007).
- **Sparse Eigen Methods by D.C. Programming.** ICML, International Conference on Machine Learning. Bharath K. Sriperumbudur, David Torres and Gert Lanckriet (2007).
- **Identifying Words that are Musically Meaningful.** ISMIR, International Conference on Music Information Retrieval. David Torres, Douglas Turnbull, Luke Barrington and Gert Lanckriet (2007).
- **Towards Musical Query-by-Semantic Description using the CAL500 Data Set.** SIGIR, Special Interest Research Group on Information Retrieval. Douglas Turnbull, Luke Barrington, David Torres and Gert Lanckriet (2007).
- **Semantic Similarity for Music Retrieval.** Music Information Retrieval Evaluation Exchange (MIREX). Audio Music Similarity Task - 3rd Place (no statistically significant Difference between top 4 teams). Luke Barrington, Douglas Turnbull, David Torres, Gert Lanckriet (2007).
- **Modeling the Semantics of Sound.** NIPS Workshop on Advances in Models for Acoustic Processing. Douglas Turnbull, Luke Barrington, David Torres, Gert Lanckriet (2006).