

David Torres

Software Consultant at Anssur Corp

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Summary

Software engineer with an extensive background in mathematical modeling and scientific computation with an emphasis in machine learning and data mining algorithms. I have developed applications in computer vision, robotics, bioinformatics and business intelligence. My skills include:

- Classification and pattern recognition methods
- Computer vision and image processing algorithms
- 3D reconstruction methods
- Mathematical optimization
- OOD

Specialties

C/C++ • C# • .NET • Java • ActionScript • Python • Visual Basic • Matlab • Octave • OpenCV • Flash/Flex/AIR • Intel Performance Primitives • BlazeDS • Apache Tomcat • Web Services • SQL Server • MySQL • Eclipse IDE • MS Visual Studio • Linux Development • Windows Development

Experience

Software Consultant at Anssur Corp.

July 2009 - Present (2 years 1 month)

- Consultant (Subcontractor) at Genoptix Medical Laboratory, Carlsbad, CA. Development of a Flash/AIR based dash-board application (RIA) that performs visualization and analysis of company-wide operational data. Designed and developed across all layers of a heterogeneous architecture which include a Flash/AIR front end that performs object remoting to company SQL servers via an Apache Tomcat server running BlazeDS.
- Consultant (Subcontractor) for Cyntellect, San Diego, CA. Developed algorithm prototyping application for rapid prototyping, visualization and profiling of image processing algorithms. Developed a plug-in architecture for dynamic loading/unloading of test code. Application bridged .NET and Matlab, allowing users to use hybrid-code.
- (Cyntellect) Developed detection/segmentation algorithms for images of wells containing embryoid bodies. Implemented watershed and Otsu based thresholding to detect, segment and count cell clusters. Improved the existing performance of software significantly.
- (Cyntellect) Conducted MTF Analysis of instrument imaging components to verify image

resolution quality.

Software Engineer at Vision Robotics

April 2008 - June 2009 (1 year 3 months)

Vision Robotics specializes in developing autonomous robotic solutions for agriculture, defense and home/office applications. Accomplishments include:

- Developed image interest point detection libraries based on Harris and Moravec corner detection algorithms.
- Developed stereo image pair 3D reconstruction algorithms for use in robotic obstacle avoidance. Implemented correlation based pixel matching methods and stereopsis for use in a robotic grape vine pruner and robotic apple picker.
- Development of object recognition methods for use in fruit detection. Employed SVM and nearest neighbor classification techniques on bag-of-visual-words features for feasibility analysis.
- Conducted research of fruit color space properties to improve color based object detection. Employed visualization and GMM analysis on RGB and HSV color spaces to derive an efficient threshold based classification algorithm.
- Developed algorithms for detecting, tracking and performing 3D reconstruction of grape vine anatomy across a time series of moving stereo pair images. Employed edge detection, watershed based skeletonization, Hough line transforms.
- Optimized dense disparity map calculation libraries using Intel IPP/MKL libraries. Obtained speed up of over 8x.
- All development was done in C/C++ in a Linux environment. Also developed in Matlab and Octave for prototyping and visualization.

(See video <http://www.youtube.com/watch?v=9GaGO9LIDEA>)

1 recommendation available upon request

Research Assistant at Jacob's School of Engineering at the University of California at San Diego

May 2006 - May 2009 (3 years 1 month)

- Conducted research (for Master Thesis) on machine learning methods to recognize musically meaningful words from a data set of audio and text examples. Implemented a novel algorithm, Sparse CCA, to explore correlations between audio and text. Experience using convex optimization packages SeDuMi, CVX, Mosek.

- Helped develop a music auto-tagging and keyword search engine. Involved GMM analysis of audio features and text using advanced EM methods (Mixture Hierarchies EM) to deal with large datasets.
- Published several articles based on research.

Software Consultant at Music Search, Inc.

September 2007 - January 2008 (5 months)

Music Search Inc. is developing a music search engine based on machine learning methods.

Accomplishments include:

* Worked with team to develop software pipeline to analyze music and interface with web-facing database. Worked on software to interact with data base, perform audio feature extraction, and perform GMM analysis. Development in Java, PHP and mySQL on LAMP servers. Used Hibernate to interface Java with mySQL.

* Developed and optimized search engine queries in mySQL.

* Developed software for a Flash-based data-collection game deployed on Facebook (<http://herdit.org>). Developed back-end game logic, including AI-bots. Development done in Java, mySQL and ActionScript.

1 recommendation available upon request

Software Engineer at Sequenom

June 2005 - September 2005 (4 months)

* Extended the capabilities of genetic sequence analysis software tools. Tools were used in mass spectrometry based analysis of nucleic acids. Genomic data from MySQL databases were used for design and the tools executed on a high-availability, high-performance, clustered Linux system. Ported assay design software from Windows to Linux to improve maintainability and performance of code.

1 recommendation available upon request

Student Software Engineer at Applied Research Labs at the University of Texas at Austin

May 2002 - May 2004 (2 years 1 month)

* Performed software development on an automated sonar-based submarine detection/classification system. Work included developing scientific software in C/C++, and Matlab in a Linux environment.

* Performed internal research project on clustering algorithm efficacy within out software architecture.

* Work required security clearance.

1 recommendation available upon request

Publications

Semantic Annotation and Retrieval of Music and Sound Effects

Transactions on Audio, Speech and Language Processing, Volume: 16, Issue 2.

Authors: David Torres

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

Authors: David Torres

David Torres, Bharath K.

Sriperumbudur, and Gert Lanckriet (2007).

Sparse Eigen Methods by D.C. Programming

ICML, International Conference on Machine Learning

Authors: David Torres

Bharath K. Sriperumbudur, David Torres and Gert Lanckriet (2007).

Identifying Words that are Musically Meaningful

ISMIR, International Conference on Music Information Retrieval

Authors: David Torres

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

Authors: David Torres

Douglas Turnbull, Luke

Barrington, David Torres and Gert Lanckriet (2007).

Semantic Similarity for Music Retrieval

Music Information Retrieval Evaluation Exchange (MIREX)

Authors: David Torres

Audio Music Similarity Task - 3rd Place (no statistically significance 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

Authors: David Torres

Education

University of California, San Diego

Masters of Science, Computer Science, Machine Learning, 2009

The University of Texas at Austin

BS, Computer Science, 2004

The University of Texas at Austin

BS, Mathematics, 2004

Socorro High School

Interests

machine learning, computer vision, artificial intelligence, scientific computation, software development, visualization, analysis

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4 people have recommended David

"David was the go-to image processing guy at VRC. David's forte is vision algorithm implementation. He was successful in incorporating the image processing routines into VRC software, which was very critical for the demos. David also is a methodical and logical software engineer, capable of weeding out logical bugs in the code intuitively. David was a great colleague to work with and I learned a lot from him."

— **Ashwin Mudigonda**, *Robotics Engineer, Vision Robotics Corp*, worked directly with David at Vision Robotics

"David was an excellent developer who built a complex Java server system that I have been using for over two years without problems. His technical skills were top notch and he was able to understand and communicate with the rest of the team in a manner that made the development efficient and effective. I also worked with David on various machine learning research projects and found his mathematical depth and writing skills to be first rate."

— **Luke Barrington**, *Student, University of California, San Diego*, worked directly with David at Music Search, Inc.

"Dave performed very well with his project at Sequenom and was a pleasure to work with. Dave proved himself to be a talented and adaptable problem solver."

— **Guy Del Mistro**, *Principle Scientific Programmer, Sequenom, Inc.*, managed David at Sequenom

"David is a creative and hard working individual. Give him a problem, he'll find an intuitive yet innovative answer. As a student programmer, David was industrious, and productive. He never lacked interest in his projects or time on his deadlines. David displayed a strong sense of responsibility balancing his school work with his project requirements while still maintaining an active social life. David is outgoing and easy to approach making him an excellent team member. He can take the lead as easily as follow depending on the project. Given the opportunity, I would proudly work with David again."

— **Kimberly Farrington**, *Acoustic Analyst, Applied Research Labs University of Texas*, managed David indirectly at Applied Research Labs at the University of Texas at Austin

[Contact David on LinkedIn](#)