

Carlos Torres | Electrical Engineering | Ph.D.

Ph: +1 (408) 418 8107 • Email: carlos.torres.ee@gmail.com • Web: torrescarlos.com

PROFILE SUMMARY

Driven machine learning and data science researcher with +11 years' experience in industry and academia, planning, managing, and executing technologically ambitious projects. Applications include: insurability risk estimation and smoker likelihood, time-series workflow forecasting, small-object detection, multiple-object tracking, image classification, behavior representation and analysis, edge computing (IoT), and multimodal latent systems. Mentor and manager of engineers and researchers.

EDUCATION

- **Doctor's of Philosophy (Ph.D.), University of California, Santa Barbara (2017)** in Electrical and Computer Engineering: Computer Vision, Machine Intelligence, Multimodal Distributed Systems, and Healthcare. **Advisor:** B. S. Manjunath. **Thesis:** Multimodal Analytics for Healthcare. Design, fusion, and analysis of multimodal sensor data in natural healthcare environments. – Press Coverage: [MESH](#)
- **Master's of Science (M.S.) University of California, Santa Barbara (2012)** Electrical and Computer Engineering: Signal Processing (M), Control Systems (m), & Machine Intelligence (m).
- **Dual Bachelor's of Science (B.S.) San Jose State University (2009)** Electrical Engineering: Digital Circuit Design and Digital Communications; and Bioengineering: Chemistry and Biochemistry.

RELEVANT WORK & RESEARCH EXPERIENCE

Mayachitra, Inc. (Santa Barbara, CA) ([Mayachitra's site](#))

Principal Investigator & Senior Researcher (August 2018 – Present)

- Design systems and algorithms for various defense, military, and intelligence agencies by combining classical machine learning and computer vision methods with artificial neural nets and deep learning.
- Principal Investigator (PI): National Geospatial-Intelligence Agency (NGA) Phase I/II projects: "Deriving uncertainty estimates for automated observations of objects from aerial imagery".
- Submitted award-winning grants to Department of Defense (DoD): RIFs and SBIRs Phase I & II.

Procore Technologies (Carpinteria, CA) ([Procore's site](#)).

Senior Lead Data Scientist & Machine Learning Researcher (November 2016 – August 2018)

- Devised highly accurate timeliness and response predictive models and systems for Procore's construction management platform.
- Developed internal churn, revenue, and performance forecasts.
- Deployed technical drawings and workflow analysis processes using computer vision and Natural Language Processing, producing two patents.

Carpe Data (Santa Barbara, CA) ([Carpe's site](#))

Chief Data Scientist (November 2015 – November 2016)

- Developed and deployed methods to process unstructured and highly uncertain data to estimate insurance risk levels. The methods use natural language processing and machine learning principles.
- Designed and prototyped new methods to estimate auto-loss, smoker, and false-claim likelihoods from web-footprint data, resulting in continued revenue-producing services.

UC Santa Barbara, Vision Research Laboratory (Santa Barbara, CA) ([VRL's site](#))

Post-Doctoral Researcher / Specialist, Vision Research Laboratory (2018–Present).

- Manage projects: (1) methane plume detection via large area hyperspectral overhead imagery and deep learning and (2) behavior analysis on weakly labeled data via Actor Centered Activation Maps.
- Mentor for Masters and Doctoral students in computer vision and deep learning research projects.

UC Santa Barbara, Vision Research Laboratory (Santa Barbara, CA) ([VRL's site](#))

Graduate Student Researcher (2010–2015)

- Developed methods and algorithms for multimodal sensor fusion for behavior analysis.
- Deployed multimodal temporal analysis system to monitor healthcare workflows and interactions.

SELECTED GRANTS, AWARDS & FELLOWSHIPS

- **US-NAVY ONR SBIR Phase I Grant. Awarded Mayachitra, Inc., Santa Barbara.** PI: Multimodal Sentiment-Evolution Analysis for Latent-Risk Estimation, Phase I: Oct 2019 - Sep 2020.
- **US-NGA SBIR Phase I Grant. Awarded Mayachitra, Inc., Santa Barbara.** PI: Improving Uncertainty Estimation with Neural Graphical Models, Phase I: Sep 2018–Jun 2019 and Phase II: Granted (TBD).
- **US-ARMY Seed Grant. University of California Santa Barbara.** Author: Multimodal Sensor Network, Dec 2013–May 2015.
- **National Science Foundation (NSF). University of California Santa Barbara.** Fellowship Recipient, LSAMP Bridge-to-the-Doctorate, Sep 2009–Sep 2011.
- **National Institutes of Health (NIH). San Jose State University.** Fellowship Recipient, Maximizing Access to Research Careers (MARC), May 2007–May 2009.

SELECTED PUBLICATIONS, PROJECTS & OUTREACH [\[Complete List\]](#)

Journals

- **Carlos Torres**, Jeffrey C. Fried, and B. S. Manjunath. “Healthcare Event and Activity Logging”. In IEEE / EMBS Journal of Translational Engineering in Health and Medicine (JTEHM), 2018. [\[pdf\]](#)
- **Carlos Torres**, Kenneth Rose, Jeffrey C. Fried, and B. S. Manjunath. A Multiview Multimodal System for Monitoring Patient Sleep. In IEEE Trans. on Multimedia. 2018. [\[pdf\]](#)

Conferences

- **Carlos Torres**, T. Nanjundaswamy, and S. Chandrasekaran. “Uncertainty and Robustness Estimation and Remediation Methods for Deep Neural Network Architectures”. [\[preprint\]](#)
- **Carlos Torres**, S. Kumar, A. Ayasse, R. Dar, and B.S.Manjunath. “Deep Remote Sensing Methods for Methane Detection in Overhead Hyperspectral Imagery”. [\[preprint\]](#)
- O. Ulutan, **Carlos Torres**, S. Rallapalli, M. Srivatsa, and B. S. Manjunath. “ACAM: Actor Conditioned Attention Maps for Video Action Detection”. [\[ArXiv-pdf\]](#)
- **Carlos Torres**, A. J. Bency, J. C. Fried, and B. S. Manjunath. “RAM: Role Representation and Identification from combined Appearance and Activity Maps”. In IEEE / ACM Int’l Conf. on Distributed Smart Cameras (ICDSC), 2017. Invited paper. [\[pdf\]](#)
- **Carlos Torres**, K. Rose, Jeffrey C. Fried, and B. S. Manjunath. “DECU: Summarization of Patient Motion in the ICU”. In European Conf. on Computer Vision (ECCV), 2016. [\[ArXiv-pdf\]](#)
- **Carlos Torres**, V. Fragoso, J. C. Fried, S. D. Hammond, and B. S. Manjunath “Eye-CU: Sleep Pose Classification for Healthcare using Multimodal Multiview Data”. In IEEE Winter Conf. on Applications of Computer Vision (WACV), 2016. [\[ArXiv-pdf\]](#)

Projects

- **Relational RNN (r-RNN) For Complex Activity Representation and Analysis.** Devised pair-wise relational information and recursive neural networks (r-RNNs) to represent object-pair behavior (interactions) sequences overtime. Developed using PyTorch, Relational RNNs, and Deep-SORT.
- **Uncertainty Methods for Robust Activity Recognition in Overhead Imagery.** Developed activity and scene representation and detection methods that use patterns in the uncertainty of predictions made by existing neural networks using novel object grouping and group aggregation techniques.
- **Behavior Analysis in Aerial-Imagery from Small Samples.** Specialized detection, tracking, and analysis of maritime overhead imagery. Developed using PyTorch, Mask-RCNN, and SORT.

Outreach: Technical Reviewer

- IEEE-PAMITC’s Winter Conf. on Applications of Computer Vision [\[WACV-17,- 19, and -20\]](#).
- Association of Computing Machinery (ACM)’s Intelligent User Interfaces [\[UI -16 and -17\]](#).

SKILLS [\[GitHub\]](#)

- **Programming:** Bash, C/C++, LATEX, Matlab/Octave, R, Python, SQL, and SSH.
- **Expertise:** Data Sciences, Deep Learning, Machine Vision & Learning, and Multimodal Analytics.
- **Tools:** AWS, Docker, Git, TF/Keras, NLP, OpenCV, Pandas, PySpark, PyTorch, Sklearn, and XGB.