Statistical Consulting at CSUF for Corporate Partners

What drives us: The Bureau of Labor Statistics (BLS) projects that employment of statisticians alone will grow 34% through 2024, compared to 7% for other occupations. Furthermore, 78% of the employers who have hired a data analysis position in the last 12 months reported they had difficulty recruiting qualified candidates. Statistical Consulting is available through Cal State Fullerton's Center for Computational and Applied Mathematics (CCAM) Corporate Partners Program. We are looking to partner with local companies to provide student hands-on learning opportunities that prepare them for the workforce, build the capacity of the CCAM and fuel the pipeline of qualified talent.

CCAM offers three tiers, based on the desired level of engagement with students and faculty on projects related to statistics or data analytics.

Undergraduate Class Project - CCAM will partner with the Corporate Partner to develop a scope of work that aligns with the educational outcomes of the class, while providing mentoring and networking opportunities for the students. These projects typically run during the fall, spring or summer semesters.

Student Team Industry Project - CCAM will build a team of undergraduate and/or graduate students who will work on a project outside of course curriculum. These projects typically run during the fall, spring or summer semesters.

Faculty Research Project - Expert CCAM faculty will lead highly complex or technical research projects. Our hope is each project involves students, however the goal of this level is to connect industry to faculty expertise.

Corporate Partner membership provides businesses an opportunity to form a deeper connection with CCAM and the College of Natural Science and Mathematics. In addition to the close connection formed through working on a project, Corporate Partners benefits include:

- A recruitment pipeline of talented and motivated students
- Student teams offering a fresh perspective on challenges or new projects
- Increase visibility in the CSUF community
- Access to faculty thought leaders and research
- Playing a role in helping the mentor the next generation of talent.

Typically CCAM suggests 3 months lead-time to build out a student team project, however if a shorter time-line is needed, please connect with us.
Who we are: The CCAM Corporate Partners program is supervised by internationally recognized statisticians with expertise in Bayesian statistics, statistical and machine learning, design of experiments, and computational statistics and includes graduate students from M.S. programs in Applied Mathematics and Statistics as well as undergraduate students majoring in Mathematics. We write code in Python, R, C, SAS, and Matlab, and have access to a major computing cluster.

Specialties include, but are not limited to:

1) **Experimental Design:** randomized block design, Latin Square designs, nested and split plot designs, factorial designs and orthogonal arrays, response surface methods and composite designs, with applications in drug combinations, discrete choice experiments, public health, engineering, and other disciplines.

2) **Statistical Inference and Predictive Modeling:** parametric and nonparametric models for inferential statistics, including generalized linear models (GLM), LASSO, and GLM with mixed effects. All aspects of predictive modeling including model selection, model validation, and model interpretation.

3) **Bayesian Statistics:** parametric and nonparametric Bayesian models for inference and prediction, particularly Bayesian hierarchical models via Dirichlet and Gaussian processes with applications in biology, finance, and other disciplines. Full Markov chain Monte Carlo (MCMC) approaches for posterior distribution sampling, including Hamiltonian MCMC.

4) **Machine Learning:** supervised and unsupervised learning for low and high dimensional data, including classification and clustering via mixture of distributions, neural networks, deep learning, random forests, principal component analysis and graphical modeling for high dimensional data, sparse linear modeling, decision trees, and ensemble methods.

5) **Point Process Techniques and Time Series Analysis:** analysis of discrete and continuous time-dependent data, including inhomogeneous Poisson process models for random events, time series analysis in frequency domain, ARMA models for periodic time series, and generalized ARMA models for time series regression with continuous and count responses.

6) **Survival Analysis:** Kaplan-Meier and Cox Proportional Hazards methods.

Past partnerships: Corporate Partners that have worked with our faculty and/or students in the past include the RAND Corporation, Cox Communications, Spectrum Pharmaceuticals, L3 Technologies, Black Swan Data and Black Forest Seven.

State, local and federal agency partners that have worked with our faculty and/or students in the past include the Los Angeles Police Department, Southern California Coastal Water Research Project and the National Oceanic and Atmospheric Administration.

How to contact us: E-mail sc.ccam@fullerton.edu to learn more about CCAM's capabilities. Please reach out to Nicole Bailey at 657-278-4847 or nbailey@fullerton.edu to become a Corporate Partner.