

# Cody Carroll

## Curriculum Vitae

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### Education

- 2021 **PhD in Statistics**, *University of California, Davis*.  
Dissertation Title: Intercomponent Time Dynamics for Multivariate Functional Data  
Advisor: Hans-Georg Müller
- 2017 **MS in Statistics**, *University of California, Davis*.
- 2014 **BS in Mathematics**, *University of Texas, Austin*.

### Research Interests

**Functional and longitudinal data analysis**— time dynamics of multivariate functional data; constrained functional data analysis; imputation; analysis of random objects

**Applications**— longitudinal studies; growth and development; aging and longevity

### Professional Experience

- 2021 - 2022 **Quantitative Analytics Fellow**, *Wells Fargo*, Charlotte, NC.
- Automate processes in Python for documenting credit decisioning ML models
  - Present automation workflow and resulting model development documents to fellow quants and management in the Risk Modeling Group

### Publications and Preprints

\* indicates co-first authorship

#### Theory and Methodology

- 2020 *Cross-component Registration for Multivariate Functional Data, with Application to Growth Curves*  
**C. Carroll**, H.-G. Müller, and A. Kneip, *Biometrics* 2020.
- 2021 *Learning Delay Dynamics for Multivariate Stochastic Processes, With Application to Predicting COVID-19 Case Trajectories in the United States*,  
P. Dubey, Y. Chen, A. Gajardo, S. Bhattacharjee, **C. Carroll**, H. Chen, Y. Zhou, and H.-G. Müller. *Journal of Mathematical Analysis and Applications*, 2021.
- 2021+ *Latent Transport Models for Multivariate Functional Data*  
**C. Carroll** and H.-G. Müller. *Submitted to Biometrics*.

#### Interdisciplinary Applications

- 2020 *Time-Dynamics of COVID-19*  
**C. Carroll**, S. Bhattacharjee, Y. Chen, P. Dubey, J. Fan, A. Gajardo, X. Zhou, H.-G. Müller, J.-L. Wang, *Scientific Reports* 2020.
- 2020 *Mountaineers in an extreme environment: an update on effects of age and sex on rates of success and death on Mount Everest*  
R. B. Huey\*, **C. Carroll\***, R. Salisbury, J.-L. Wang, *PLoS One* 2020.
  - received media coverage from *The Economist*, *Reuters*, & *The London Times*

- 2021 *A Practical Method to Quantify Knowledge-Based Dose Volume Histogram Prediction Accuracy and Uncertainty with Reference Cohorts*  
B. Covele, **C. Carroll**, K. Moore, *Journal of Applied Clinical Medical Physics*, 2021.
- 2022 *Comparison of Diagnostic Predictors of Neonatal Survivability in Non-Domestic Caprinae*  
T. N. Bliss, M. J. Marinkovich, R. E. Burns, **C. Carroll**, M. M. Clancy, and L. L. Howard.  
*Journal of Zoo and Wildlife Medicine*, to appear.

## Software

Contributor/ *fdapace: Functional Data Analysis and Empirical Dynamics. R package.*  
Former **C. Carroll**, A. Gajardo, Y. Chen, X. Dai, J. Fan, P. Z. Hadjipantelis, K. Han, et al.  
Maintainer <https://CRAN.R-project.org/package=fdapace>.

## Presentations

### Talks

- 2022 **UC Berkeley.**  
Case Study in Data Science Pedagogy: Linear Association and Correlation
- 2021 **Lawrence Livermore National Lab.**  
Latent Transport Models for Multivariate Functional Data
- 2020 **Statistics Student-Led Seminar Series, UC Davis.**  
Shift-Warping for Multivariate Functional Data
- 2019 **NSF RTG Statistics Workshop Series, UC Davis.**  
Deception and Coin Flips: Statistical Intuition through Lies and Games
- 2018 **NSF RTG Symposium: Modern Tools for Statistics, UC Davis.**  
An Introduction to Functional Data Analysis
- 2018 **Statistics Student-Led Seminar Series, UC Davis.**  
Time Warping for Human Growth Curves

### Posters

- 2020 **Joint AAPM/COMP Meeting, Benchmarking Dose-Volume Histogram Prediction Accuracy Between Different Knowledge-Based Models**, Vancouver, BC, Canada

## Teaching

### Instructor of Record

- Summer 2019 **Brief Course in Mathematical Statistics II.**  
UC Davis, Dept. of Statistics
- Spring 2019 **Applied Statistics for Biological Sciences.**  
UC Davis, Dept. of Statistics
- Summer 2018 **Applied Statistics for Business and Economics.**  
UC Davis, Dept. of Statistics/Dept. of Economics

### Teaching Assistant

- *Applied Statistics for Biological Sciences* (Su17) UCD, Statistics
- *Applied Statistics for Business and Economics* (F19) UCD, Statistics/Economics
- *Applied Statistical Methods Regression Analysis* (F17) UCD, Statistics
- *Introduction to Probability Theory* (S18) UCD, Statistics
- *Mathematical Statistics* (W21) UCD, Statistics

- *Survival Analysis* (F18) UCD, Statistics/Biostatistics, *Grad. Level*
- *Statistical Consulting* (W18, W19, W20) UCD, Statistics/Biostatistics, *Grad. Level*

#### International Teaching

2014-2015 **ESL Teacher**, *Nishinomiya Imazu Senior High School*, Nishinomiya, Japan.

### Mentoring Experience

2017-2020 **NSF Research Training Group**, *Dept. of Statistics, UC Davis*.

Advising Undergraduate Research

- *Warping methods for wearable device data*, with Hainiu Xu
- *Functional regression for wearable device data*, with Phoebe Biying Li
- *Functional clustering for wearable device data*, with Weiyi Chen
- *Geographic trends for functional housing price data*, with Yunbai Zhang
- *Functional data analysis of global temperature extrema*, with Cynthia Lai

2020 **Mentor for Undergraduate Honors Thesis.**

*Warping methods for wearable device data*, by Hainiu Xu

### Awards and Fellowships

2021 **Peter Hall Graduate Research Award.**

Awarded once yearly to the top PhD graduate for excellence in statistical research during degree, *Dept. of Statistics, UC Davis*

2021 **Alan Fenech Service Award.**

*Dept. of Statistics, UC Davis*

2020 **Outstanding Graduate Teaching Award.**

Awarded to 10 graduate students university-wide, *Grad. Studies, UC Davis*

2020 **Excellence in Teaching Award.**

Awarded to one student instructor in the department on special occasion, *Dept. of Statistics, UC Davis*

2015-2020 **NSF Research Training Grant Recipient.**

2016-2019 **Summer Statistics Research Fellowship Award.**

*Dept. of Statistics, UC Davis*

2017-2019 **TA Recognition Award.**

*Dept. of Statistics, UC Davis*

2015-2018 **UC Davis Graduate Scholars Fellowship.**

*Grad. Studies, UC Davis*

### Professional Service

Editorial Review

- *Annals of Statistics*
  - *Journal of the American Statistical Association*
  - *Biometrika*
  - *Computational Statistics and Data Analysis*
  - *Computer Methods and Programs in Biomedicine*
- UC Davis
- Graduate Student Representative, *Dept. of Statistics*

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## Technical skills

Advanced R, Python, git,  $\text{\LaTeX}$   
Intermediate SQL, Julia, Travis-CI  
Basic Adobe Illustrator

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## References

### **Hans-Georg Müller**

Distinguished Professor, *University of California, Davis*  
hgmuller@ucdavis.edu

### **Jane-Ling Wang**

Distinguished Professor, *University of California, Davis*  
janelwang@ucdavis.edu

### **Wolfgang Polonik**

Professor, *University of California, Davis*  
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