
CURRICULUM VITAE

Christopher T. Franck, Ph.D.

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CONTACT INFORMATION

Department of Statistics

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EDUCATION AND TRAINING

Ph.D. in Statistics, North Carolina State University, Raleigh, NC, 2010

Thesis: Mixture based interaction effects in unreplicated factorial experiments

Advisor: Jason Osborne, Associate Professor of Statistics, North Carolina State University

M.Stat. in Statistics, North Carolina State University, Raleigh, NC, 2007

B.S. in Statistics, Virginia Tech, Blacksburg VA, 2005

PROFESSIONAL APPOINTMENTS

Aug 2022 – present	Associate Professor, Department of Statistics, Virginia Tech
Aug 2016 – Aug 2022	Assistant Professor, Department of Statistics, Virginia Tech
Dec 2011 – Dec 2020	Assistant Professor, Virginia Tech Carilion School of Medicine
Mar 2011 – Aug 2016	Assistant Research Professor, Virginia Tech Carilion Research Institute
Aug 2010 – Aug 2016	Assistant Research Professor, Department of Statistics, Virginia Tech; Assistant/Interim Director of the Laboratory for Interdisciplinary Statistical Analysis (LISA)
Dec 2013 – Dec 2014	Associate Director of Analytics, Virginia Center for Housing Research
Jul 2009 – May 2010	College of Agriculture and Life Sciences Consulting Research Assistant, North Carolina State University
Feb 2009 – Aug 2009	Graduate Research Assistant at Rho, Inc., Chapel Hill, NC
Aug 2005 – Jan 2009	Graduate Teaching Assistant, Department of Statistics, North Carolina State University

AWARDS AND HONORS

September 2015	Editor's Choice Invited Preeminent Tutorial, <i>Journal of Experimental Analysis of Behavior</i> , given at the Society for the Quantitative Analyses of Behavior, Chicago, 2016
Spring 2010	Francis G. Giesbrecht Statistical Consulting Enhancement Award, North Carolina State University
Spring 2008, 2009	Outstanding Teaching Assistant Award, Department of Statistics, North Carolina State University
Spring 2008	Paige Plagge Award for Citizenship, Department of Statistics, North Carolina State University
Summer 2007	Recipient of VIGRE Fellowship, North Carolina State University
November 2004	Inducted into Mu Sigma Rho: National Statistical Honor Society, Virginia Tech Chapter

PROFESSIONAL SERVICE AND AFFILIATIONS

University Service

- College of Science Educational Workgroup, 2019
- Department of Statistics Search Committee, Biostatistician, 2017-2018
- Department of Statistics Search Committee, Stat Lab Director, 2016
- Department of Statistics Social Committee, 2016 – present
- Department of Statistics Colloquium Committee, 2016-2018 (chair fall 2017 – spring 2018)
- Periodic Review Committee: Executive Director of the Virginia Tech Carilion Research Institute, 2015
- Medical Curriculum Committee for Virginia Tech Carilion School of Medicine, 2012-2015
- Department of Statistics Search Committee, Department Head, 2014
- College of Science Communication Committee, 2012

Service to National Organizations

- Technometrics Wilcoxon/Youden Prize Committee 2024-2025
- DATAWorks Planning Committee 2024
- Conference on Statistical Practice Steering Committee, 2019-2021
- W.J. Dixon Award Committee for the American Statistical Association, 2015-2017

Membership in Professional Societies

- American Statistical Association
- Sigma Xi: The Scientific Research Honor Society
- Association for Behavior Analysis International

Editorial Activities

- Addiction (referee)
- The American Statistician (referee)
- Annals of Applied Statistics (referee)
- Assessment (referee)
- Bayesian Analysis (referee)
- Behavioral Decision Making (referee)
- Behavioral Processes (referee)
- Biometrics (referee)
- Drug and Alcohol Dependence (referee)
- Environmental and Ecological Statistics (referee)
- Environmetrics (referee)
- European Journal of Behavior Analysis (referee)
- IEEE Journal of Biomedical and Health Informatics (referee)
- International Statistical Review (referee)
- International Journal of Psychology (referee)
- Journal of the American Statistical Association (referee)
- Journal of Applied Statistics (referee)
- Journal of Individual Differences (referee)
- Journal of Multivariate Analysis (referee)
- Journal of Experimental Analysis of Behavior (referee, guest associate editor)
- PLOS ONE (referee)
- Preventative Medicine (referee)
- Psychological Assessment (referee)
- Stat (referee)
- Technometrics (associate editor)

TEACHING AND MENTORING

Aug 2024-present

Regression Analysis

- Taught as a comparative assessment between classical statistical regression approaches and (mostly tree-based) machine learning methods. A contemporary exploration of Leo Breiman's classic paper *Statistical Modeling: The Two Cultures*.

Aug 2021-2022

Probability and Distributions

- Probability theory, including set theoretic and combinatorial concepts; random experiments; discrete and continuous random variables and their probability mass and density functions; expectation and variance; conditional probability; maximum likelihood estimation.

Jan 2020

Scientific Writing for Statistics

- Training in scientific writing with a focus on statistical writing including structure, effectively motivating research, reviewing scientific literature, and providing and responding to feedback.
- Jan 2019 – present Contingency Table Analysis/Intro to Categorical Data Analysis
- Statistical techniques for frequency data including goodness-of-fit, tests and measures of association for two-way tables, log-linear models for multidimensional tables, parameter estimation, model selection, incomplete tables, ordinal categories, and logistic regression.
- Aug 2017 – 2022 Inference Fundamentals
- Classical and resampling-based approaches for point estimation, interval estimation, and hypothesis testing with emphasis on using R, visualizing data, computing and interpreting effect sizes, and conducting Monte Carlo simulation.
- Jan 2016 Introduction to Python and SQL
- Taught data types, table creation, selection and filtering, scripts, aggregate functions, joins, HTML parsing basics, and an introduction to web scraping.
- Aug 2011 – Aug 2016 Biostatistics
- Responsible for developing and teaching biostatistics curriculum to first-year medical students at Virginia Tech Carilion School of Medicine.
- Aug 2010 – Dec 2016 Introduction to Statistical Program Packages
- Taught data management, visualization, analysis, modeling, computation, hypothesis testing, simulation, and the Bayesian paradigm to first-year statistics graduate students using R, LaTeX, and SAS.
- May 2008 – Aug 2008 Teaching Assistant, Computational Undergraduate Statistics Program
- Instructed undergraduate statisticians in computational modeling and data mining approaches for consulting projects.
- Aug 2007 – Dec 2008 Introduction to Statistics
- Responsible for writing and delivering lectures, exams, and other assessments.
- May 2006 – Apr 2007 Experimental Statistics Computer Lab
- Instructed students in the use of statistical software for analysis, modeling, and visualization.
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STUDENT ADVISEES

Ph.D. Students - Completed

- Matthew Keefe, Statistics, co-chair
- Thomas Metzger, Statistics, chair
- Erica Porter, Statistics, co-chair

Ph.D. Students – Current

- Anna Flowers, co-chair
- Adeline Guthrie, Statistics, chair
- Mingang Kim, Statistics, chair
- Amy Vennos, chair

Completed Statistics M.S. and Research Associates

- Celia Eddy
- James Wrenn

Ph.D. Committee Service

- Leigh Allin, Biomedical Engineering, committee member
- Danielle Beringer, Biomechanics, committee member
- Prashant Chandrasekar, Computer Science, committee member
- Danielle Choi, Genetics, Bioinformatics, and Computational Biology, committee member
- Mohamed Ibrahim El Khouly, Statistics, committee member
- Phil Geun Jin, Statistics, committee member
- Ting Guan, Statistics, committee member
- Chen Han, Statistics, committee member
- Gareth Highnam, Genetics, Bioinformatics, and Computational Biology, committee member
- Jiangeng Huang, Statistics, committee member
- Hwasoo Shin, Statistics, committee member
- Zhengzhi Lin, Statistics, committee member
- Lexie Mellis, Translational Biology, Medicine, and Health, committee member
- Jie Min, Statistics, committee member
- Lara Moody, Psychology, committee member
- Ana Maria Ortega, Statistics, committee member
- Sierra Merkes, Statistics, committee member
- Tina Rossi, Biomechanics, committee member
- Mohamed Salem, Statistics, committee member
- Sumin Shen, Statistics, committee member
- Hwasoo Shin, Statistics, committee member
- John Smith, Statistics, committee member
- Man Tang, Statistics, committee member
- Guan Ting, Statistics, committee member

- Robin Varghese, Genetics Bioinformatics and Computational Biology, committee member
- Vinaya Vijayan, Genetics, Bioinformatics, and Computational Biology, committee member
- Stephen Walsh, Statistics, committee member
- Jacob Williams, Statistics, committee member
- Shuangshuan Xu, Statistics, committee member
- Young Ho Yun, Statistics, committee member
- Xiang Zhang, Statistics, committee member
- Zhengzhi Lin, Statistics, committee member
- Dong Zhao, Environmental Design and Planning, committee member

PUBLICATIONS

Published Articles (Underline denotes student)

1. Metzger, T. A., & **Franck, C. T.** (2024). Bayesian Model Selection with Latent Group-Based Effects and Variances with the R Package *slgf*. In press, *The R Journal*. <https://arxiv.org/abs/2404.06698>
2. Guthrie, A. P., & **Franck, C. T.** (2024). Boldness-Recalibration for Binary Event Predictions. *The American Statistician*, 78(4), 426–436. <https://doi.org/10.1080/00031305.2024.2339266>
3. Porter, E. M., **Franck, C. T.**, & Adams, S. (2024). Flexible cost-penalized Bayesian model selection: Developing inclusion paths with an application to diagnosis of heart disease. *Statistics in Medicine*, 43(16), 3073–3091. <https://doi.org/10.1002/sim.10113>
4. Kim, M., Koffarnus, M. N., & **Franck, C. T.** (2024). Thinking Inside the Bounds: Improved Error Distributions for Indifference Point Data Analysis and Simulation Via Beta Regression using Common Discounting Functions. *Perspectives on Behavior Science*, 47(2), 417–433. <https://doi.org/10.1007/s40614-024-00410-8>
5. Porter, E. M., **Franck, C. T.**, & Ferreira, M. A. (2024). Objective Bayesian model selection for spatial hierarchical models with intrinsic conditional autoregressive priors. *Bayesian Analysis*, 19(4), 985–1011.
6. Rzeszutek, M. J., Regnier, S. D., **Franck, C. T.**, & Koffarnus, M. N. (2024). Overviewing the exponential model of demand and introducing a simplification that solves issues of span, scale, and zeros. In Press, *Experimental and Clinical Psychopharmacology*.
7. Xu, S., Ferreira, M.A.R., Porter, E.M. & **Franck, C.T.** (2023) Bayesian model selection for generalized linear mixed models. *Biometrics*, 00, 1–13. <https://doi.org/10.1111/biom.13896>
8. Rzeszutek, M. J., **Franck, C. T.**, Traxler, H. K., Kaplan, B. A., & Koffarnus, M. N. (2023). Notes on demand: Conceptual and empirical benefits of applying Rachlin’s discounting equation to demand data. *Psychology of Addictive Behaviors*, 37(1), 57–71. <https://doi.org/10.1037/adb0000889>
9. **Franck, C. T.**, Arena, S. L., & Madigan, M. L. (2023). Approximate Bayesian Techniques for Statistical Model Selection and Quantifying Model Uncertainty—Application to a Gait Study. *Annals of Biomedical Engineering*, 51(2), 422–429. <https://doi.org/10.1007/s10439-022-03046-4>
10. Traxler, H. K., Kaplan, B. A., Rzeszutek, M. J., **Franck, C. T.**, & Koffarnus, M. N. (2023). Interest in and perceived effectiveness of contingency management among alcohol drinkers using behavioral economic purchase tasks. *Experimental and Clinical Psychopharmacology*, 31(1), 127–139. <https://doi.org/10.1037/pha0000580>

11. Rzeszutek, M. J., Kaplan, B. A., Traxler, H. K., **Franck, C. T.**, & Koffarnus, M. N. (2023). Hyperbolic discounting and exponentiated demand: Modeling demand for cigarettes in three dimensions. *Journal of the Experimental Analysis of Behavior*, 119(1), 169–191. <https://doi.org/10.1002/jeab.818>
12. **Franck, C. T.**, Traxler, H. K., Kaplan, B. A., Koffarnus, M. N., & Rzeszutek, M. J. (2023). A tribute to Howard Rachlin and his two-parameter discounting model: Reliable and flexible model fitting. *Journal of the Experimental Analysis of Behavior*, 119(1), 156–168. <https://doi.org/10.1002/jeab.820>
13. **Franck, C. T.**, Madigan, M. L., & Lazar, N. A. (2022). How to write about alternatives to classical hypothesis testing outside of the statistical literature: Approximate Bayesian model selection applied to a biomechanics study. *Stat*, 11(1), e508. <https://doi.org/10.1002/sta4.508>
14. Koffarnus, M. N., Kaplan, B. A., **Franck, C. T.**, Rzeszutek, M. J., & Traxler, H. K. (2022). Behavioral economic demand modeling chronology, complexities, and considerations: Much ado about zeros. *Behavioural Processes*, 199, 104646. <https://doi.org/10.1016/j.beproc.2022.104646>
15. Kaplan, B. A., Crill, E. M., **Franck, C. T.**, Bickel, W. K., & Koffarnus, M. N. (2021). Blood Nicotine Predicts the Behavioral Economic Abuse Liability of Reduced-Nicotine Cigarettes. *Nicotine & Tobacco Research*, 24(5), 728–735. <https://doi.org/10.1093/ntr/ntab227>
16. Wood, S., Lanus, E., Doyle, D. D., Ogorzalek, J., **Franck, C. T.**, & Freeman, L. (2021). Developing Hierarchies for Image Classification Model Evaluation. 2021 *4th International Conference on Artificial Intelligence for Industries (AI4I)*, 34–37. <https://doi.org/10.1109/AI4I51902.2021.00016>
17. Kaplan, B. A., **Franck, C. T.**, McKee, K., Gilroy, S. P., & Koffarnus, M. N. (2021). Applying Mixed-Effects Modeling to Behavioral Economic Demand: An Introduction. *Perspectives on Behavior Science*, 44(2), 333–358. <https://doi.org/10.1007/s40614-021-00299-7>
18. **Franck, C. T.**, & Wilson, C. E. (2021). Predicting competitions by combining conditional logistic regression and subjective Bayes: An Academy Awards case study. *The Annals of Applied Statistics*, 15(4), 2083–2100. <https://doi.org/10.1214/21-AOAS1464>
19. Ferreira, M. A. R., Porter, E. M., & **Franck, C. T.** (2021). Fast and scalable computations for Gaussian hierarchical models with intrinsic conditional autoregressive spatial random effects. *Computational Statistics & Data Analysis*, 162, 107264. <https://doi.org/10.1016/j.csda.2021.107264>
20. Metzger, T. A., & **Franck, C. T.** (2021). Detection of latent heteroscedasticity and group-based regression effects in linear models via Bayesian model selection. *Technometrics*, 63(1), 116–126. <https://doi.org/10.1080/00401706.2020.1739561>.
21. **Franck, C. T.**, & Gramacy, R. B. (2020). Assessing Bayes factor surfaces using interactive visualization and computer surrogate modeling. *The American Statistician*, 74(4), 359–369. <https://doi.org/10.1080/00031305.2019.1671219>
22. Kaplan, B. A., Koffarnus, M. N., **Franck, C. T.**, & Bickel, W. K. (2020). Effects of reduced-nicotine cigarettes across regulatory environments in the experimental tobacco marketplace: A randomized trial. *Nicotine & Tobacco Research*, ntaa226. <https://doi.org/10.1093/ntr/ntaa226>
23. McKerchar, T. L., Kaplan, B. A., Reed, D. D., Suggs, S. A., & **Franck, C. T.** (2019). Discounting environmental outcomes: Temporal and probabilistic air-quality gains and losses. *Behavior Analysis: Research and Practice*, 19(3), 273–280. <https://doi.org/10.1037/bar0000138>
24. **Franck, C. T.**, Koffarnus, M. N., McKerchar, T. L., & Bickel, W. K. (2019). An overview of Bayesian reasoning in the analysis of delay-discounting data. *Journal of the Experimental*

- Analysis of Behavior*, 111(2), 239–251. <https://doi.org/10.1002/jeab.504>
25. **Franck, C. T.** (2019). Detection of hidden additivity and inference under model uncertainty for unreplicated factorial studies via Bayesian model selection and averaging. *Technometrics*, 61(3), 283–296. <https://doi.org/10.1080/00401706.2018.1518791>
 26. **Keefe, M. J., Ferreira, M. A. R., & Franck, C. T.** (2019). Objective Bayesian analysis for Gaussian hierarchical models with intrinsic conditional autoregressive priors. *Bayesian Anal.*, 14(1), 181–209. <https://doi.org/10.1214/18-BA1107>
 27. **Franck, C. T.** (2018). Contributed discussion on using stacking to average Bayesian predictive distributions. *Bayesian Anal.*, 13(3), 917–1007. <https://doi.org/10.1214/17-BA1091>
 28. **Keefe, M. J., Ferreira, M. A. R., & Franck, C. T.** (2018). On the formal specification of sum-zero constrained intrinsic conditional autoregressive models. *Spatial Statistics*, 24, 54–65. <https://doi.org/10.1016/j.spasta.2018.03.007>
 29. Renner, K. E., **Franck, C. T.**, Miller, T. K., & Queen, R. M. (2018). Limb asymmetry during recovery from anterior cruciate ligament reconstruction. *Journal of Orthopaedic Research*, 36(7), 1887–1893. <https://doi.org/10.1002/jor.23853>
 30. Sheffer, C. E., Bickel, W. K., Brandon, T. H., **Franck, C. T.**, Deen, D., Panissidi, L., Abdali, S. A., Pittman, J. C., Lunden, S. E., Prashad, N., Malhotra, R., & Mantovani, A. (2018). Preventing relapse to smoking with transcranial magnetic stimulation: Feasibility and potential efficacy. *Drug and Alcohol Dependence*, 182, 8–18. <https://doi.org/10.1016/j.drugalcdep.2017.09.037>
 31. Gilroy, S. P., **Franck, C. T.**, & Hantula, D. A. (2017). The discounting model selector: Statistical software for delay discounting applications. *Journal of the Experimental Analysis of Behavior*, 107(3), 388–401. <https://doi.org/10.1002/jeab.257>
 32. Bickel, W. K., Moody, L. N., **Eddy, C. R., & Franck, C. T.** (2017). Neurocognitive dysfunction in addiction: Testing hypotheses of diffuse versus selective phenotypic dysfunction with a classification-based approach. *Experimental and Clinical Psychopharmacology*, 25(4), 322–332. <https://doi.org/10.1037/pha0000115>
 33. Queen, R. M., **Franck, C. T.**, Schmitt, D., & Adams, S. B. (2017). Are there differences in gait mechanics in patients with a fixed versus mobile bearing total ankle arthroplasty? A randomized trial. *Clinical Orthopaedics and Related Research*, 475(10), 2599–2606. <https://doi.org/10.1007/s11999-017-5405-7>
 34. **Keefe, M. J., Franck, C. T., & Woodall, W. H.** (2017). Monitoring foreclosure rates with a spatially risk-adjusted Bernoulli CUSUM chart for concurrent observations. *Journal of Applied Statistics*, 44(2), 325–341. <https://doi.org/10.1080/02664763.2016.1169257>
 35. **Franck, C. T., & Osborne, J. A.** (2016). Exploring interaction effects in two-factor studies using the hiddenf package in R. *The R Journal*, 8(1), 159–172. <https://doi.org/10.32614/RJ-2016-011>
 36. Garman, C. R., Nussbaum, M. A., **Franck, C. T.**, & Madigan, M. L. (2016). A pilot study exploring obesity-related differences in fall rate and kinematic response resulting from a laboratory-induced trip. *IIE Transactions on Occupational Ergonomics and Human Factors*, 4(4), 211–221. <https://doi.org/10.1080/21577323.2016.1198732>
 37. Sheffer, C. E., Mackillop, J., Fernandez, A., Christensen, D., Bickel, W. K., Johnson, M. W., Panissidi, L., Pittman, J., **Franck, C. T.**, Williams, J., & Mathew, M. (2016). Initial examination of priming tasks to decrease delay discounting. *Behavioural Processes*, 128, 144–152. <https://doi.org/10.1016/j.beproc.2016.05.002>
 38. Varghese, R. T., Liang, Y., **Guan, T., Franck, C. T., Kelly, D. F., & Sheng, Z.** (2016). Survival kinase genes present prognostic significance in glioblastoma. *Oncotarget*, 7(15),

- 20140–20151. <https://doi.org/10.18632/oncotarget.7917>
39. Moody, L., **Franck, C. T.**, Hatz, L., & Bickel, W. K. (2016). Impulsivity and polysubstance use: A systematic comparison of delay discounting in mono-, dual-, and trisubstance use. *Experimental and Clinical Psychopharmacology*, 24(1), 30–37. <http://doi.org/10.1037/pha0000059>
 40. Moody, L., **Franck, C. T.**, & Bickel, W. K. (2016). Comorbid depression, antisocial personality, and substance dependence: Relationship with delay discounting. *Drug and Alcohol Dependence*, 160, 190–196. <https://doi.org/10.1016/j.drugalcdep.2016.01.009>
 41. Bickel, W. K., Wilson, A. G., Chen, C., Koffarnus, M. N., & **Franck, C. T.** (2016). Stuck in time: negative income shock constricts the temporal window of valuation spanning the future and the past. *PLOS ONE*, 11(9), e0163051. <https://dx.doi.org/10.1371/journal.pone.0163051>
 42. Heitz, C., Prusakowski, M. K., Willis, G., & **Franck, C. T.** (2015). Does the concept of the “Flipped Classroom” extend to the emergency medicine clinical clerkship? *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 16(6), 851–855. <http://doi.org/10.5811/westjem.2015.9.27256>
 43. Sorrentino, D. R., & **Franck, C. T.** (2015). Utility of fecal markers to diagnose and monitor inflammatory bowel diseases. *American Journal of Gastroenterology*, 110(12), 1732–1733. <http://doi.org/10.1038/ajg.2015.366>.
 44. Koffarnus, M. N., **Franck, C. T.**, Stein, J. S., & Bickel, W. K. (2015). A modified exponential behavioral economic demand model to better describe consumption data. *Experimental and Clinical Psychopharmacology*, 23(6), 504–512. <http://doi.org/10.1037/pha0000045>
 45. Santo, A. R., Sorice, M. G., Donlan, J., **Franck, C. T.**, & Anderson, C. B. (2015). A human-centered approach to designing invasive species eradication programs on human-inhabited islands. *Global Environmental Change*, 35, 289–298. <https://doi.org/10.1016/j.gloenvcha.2015.09.012>
 46. **Franck, C. T.**, Koffarnus, M. N., House, L. L., & Bickel, W. K. (2015). Accurate characterization of delay discounting: A multiple model approach using approximate Bayesian model selection and a unified discounting measure. *Journal of the Experimental Analysis of Behavior*, 103(1), 218–233. <http://doi.org/10.1002/jeab.128>
 47. Garman, C. R., **Franck, C. T.**, Nussbaum, M. A., & Madigan, M. L. (2015). A bootstrapping method to assess the influence of age, obesity, gender, and gait speed on probability of tripping as a function of obstacle height. *Journal of Biomechanics*, 48(6), 1229–1232. <https://doi.org/10.1016/j.jbiomech.2015.01.031>
 48. Koebel, C. T., McCoy, A. P., Sanderford, A. R., **Franck, C. T.**, & **Keefe, M. J.** (2015). Diffusion of green building technologies in new housing construction. *Energy and Buildings*, 97, 175–185. <https://doi.org/10.1016/j.enbuild.2015.03.037>
 49. McCoy, A. P., Koebel, C. T., Sanderford, A. R., **Franck, C. T.**, & **Keefe, M. J.** (2015). Adoption of high-performance housing technologies among U.S. homebuilding firms, 2000 through 2010. *Cityscape: A Journal of Policy Development and Research*, 17(2), 167–187.
 50. Wilson, A. G., **Franck, C. T.**, Koffarnus, M. N., & Bickel, W. K. (2015). Behavioral economics of cigarette purchase tasks: Within-subject comparison of real, potentially real,

and hypothetical cigarettes. *Nicotine & Tobacco Research*, 18(5), 524–530.

<https://doi.org/10.1093/ntr/ntv154>

51. Wilson, A. G., **Franck, C. T.**, Koffarnus, M. N., Reese, R. C., Bixel, K. D., & Bickel, W. K. (2015). An internet-acquired recovery sample: Initial findings from the international quit and recovery registry. *Drug and Alcohol Dependence*, 146, e24.
<https://doi.org/10.1016/j.drugalcdep.2014.09.745>
52. Wilson, A. G., **Franck, C. T.**, Mueller, E. T., Landes, R. D., Kowal, B. P., Yi, R., & Bickel, W. K. (2015). Predictors of delay discounting among smokers: Education level and a utility measure of cigarette reinforcement efficacy are better predictors than demographics, smoking characteristics, executive functioning, impulsivity, or time perception. *Addictive Behaviors*, 45, 124–133.
<https://doi.org/10.1016/j.addbeh.2015.01.027>
53. Anderson, D. E., **Franck, C. T.**, & Madigan, M. L. (2014). Age differences in the required coefficient of friction during level walking do not exist when experimentally-controlling speed and step length. *Journal of Applied Biomechanics*, 30(4), 542–546.
<https://dx.doi.org/10.1123/jab.2013-0275>
54. Bickel, W. K., Wilson, A. G., **Franck, C. T.**, Mueller, E. T., Jarmolowicz, D. P., Koffarnus, M. N., & Fede, S. J. (2014). Using crowdsourcing to compare temporal, social temporal, and probability discounting among obese and non-obese individuals. *Appetite*, 75, 82–89.
<https://dx.doi.org/10.1016/j.appet.2013.12.018>
55. Boone, J. H., Archbald-Pannone, L. R., Wickham, K. N., Carman, R. J., Guerrant, R. L., **Franck, C. T.**, & Lyerly, D. M. (2014). Ribotype 027 *Clostridium difficile* infections with measurable stool toxin have increased lactoferrin and are associated with a higher mortality. *European Journal of Clinical Microbiology & Infectious Diseases*, 33(6), 1045–1051. <https://doi.org/10.1007/s10096-013-2043-1>
56. Brunson, J. C., Fassino, S., McInnes, A., Narayan, M., Richardson, B., **Franck, C. T.**, Ion, P., & Laubenbacher, R. (2014). Evolutionary events in a mathematical sciences research collaboration network. *Scientometrics*, 99(3), 973–998. <https://doi.org/10.1007/s11192-013-1209-z>
57. Price, J. E., Zipper, C. E., Jones, J. W., & **Franck, C. T.** (2014). Water and sediment quality in the Clinch River, Virginia and Tennessee, USA, over nearly five decades. *Journal of the American Water Resources Association*, 50(4), 837–858.
<https://doi.org/10.1111/jawr.12219>
58. Ball, D., Adames, N., Reischmann, N., Barik, D., **Franck, C. T.**, Tyson, J. J., & Peccoud, J. (2013). Measurement and modeling of transcriptional noise in the cell cycle regulatory network. *Cell Cycle*, 12(19), 3392–3407. <https://doi.org/10.4161/cc.26257>
59. **Franck, C. T.**, Nielsen, D. M., & Osborne, J. A. (2013). A method for detecting hidden additivity in two-factor unreplicated experiments. *Computational Statistics & Data Analysis*, 67, 95–104. <https://doi.org/10.1016/j.csda.2013.05.002>
60. Highnam, G., **Franck, C. T.**, Martin, A., Stephens, C., Puthige, A., & Mittelman, D. (2013). Accurate human microsatellite genotypes from high-throughput resequencing data using informed error profiles. *Nucleic Acids Research*, 41(1), e32.
<http://doi.org/10.1093/nar/gks981>
61. Levine, M. B., Moore, A. B., **Franck, C. T.**, Li, J., & Kuehl, D. R. (2013). Variation in use

- of all types of computed tomography by emergency physicians. *The American Journal of Emergency Medicine*, 31(10), 1437–1442. <http://doi.org/10.1016/j.ajem.2013.07.003>
62. Levine, M. B., Moore, A. B., Kuehl, D. R., **Franck, C. T.**, & Li, J. (2013). Emergency physician variation in admissions for common chief complaints. *Annals of Emergency Medicine*, 62(4), S60–S61. <https://doi.org/10.1016/j.annemergmed.2013.07.449>
63. Moore, A. B., Levine, M. B., Kuehl, D. R., **Franck, C. T.**, & Li, J. (2013). Emergency department physician computed tomography utilization and admission rates. *Annals of Emergency Medicine*, 62(4), S57. <https://doi.org/10.1016/j.annemergmed.2013.07.439>
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69. Shallom, S. J., Tae, H., Sarmiento, L., Preston, D., McIver, L., **Franck, C. T.**, Dickerman, A., Adams, L.G., & Garner, H. R. (2012). Comparison of genome diversity of *Brucella* spp. field isolates using Universal Bio-signature Detection Array and whole genome sequencing reveals limitations of current diagnostic methods. *Gene*, 509(1), 142–148. <https://doi.org/10.1016/j.gene.2012.07.073>
70. Zhou, L., **Franck, C. T.**, Yang, K., Pilot, G., Heath, L. S., & Grene, R. (2012). Mining for meaning: Visualization approaches to deciphering Arabidopsis stress responses in roots and shoots. *OmicS: A Journal of Integrative Biology*, 16(4), 208–228. <https://doi.org/10.1089/omi.2011.0111>
71. Gupta, P. K., **Franck, C. T.**, Miller, W. J., Gupta, H., & Forse, R. A. (2011). Development and validation of a bariatric surgery morbidity risk calculator using the prospective, multicenter NSQIP dataset. *Journal of the American College of Surgeons*, 212(3), 301–309 <https://doi.org/10.1016/j.jamcollsurg.2010.11.003>

Book Chapters

1. **Franck, C. T.** (2025). Quantitative models of discounting. From the forthcoming book *Operant Behavioral Economics* published by Elsevier.
2. **Porter, E. M., Franck, C. T., & Ferreira, M. A. R.** (2024). Gaussian spatial hierarchical models with ICAR priors. In *Modeling Spatio-Temporal Data: Markov Random Fields, Objective Bayes, and Multiscale Models* (pp. 24-47). doi:10.1201/9781032623443-2

Other Publications

1. **Franck, C. T.** (December 2024). Pawel Nazarewicz: AP Statistics Teacher Extraordinaire. *Amstat News*.
2. **Franck, C. T.** (May 2024). Starstruck: Statistician Describes work in Astrostatistics. An interview with Jessi Cisewski-Kehe. *Amstat News*.
3. **Franck, C. T.** (April 2024) A Conversation with Dean Follmann of NIAID. *Amstat News*.
4. **Franck, C. T.** (July 2023). How My First Statistics Professor Changed My Life—A Tribute to Golde Holtzman. *Amstat News*.
5. Wilson, C. & **Franck, C. T.** (2020). Our Oscars algorithm predicted the Best Picture winner. Tell us your guesses, too. *Time.com*.
6. Wilson, C. & **Franck, C. T.** (2019). We taught a computer program to predict the Oscars. Here's the movie it says will win Best Picture. *Time.com*.
7. **Franck, C. T.** (October 2013). Is Nate Silver a statistician? *Amstat News*.
8. **Franck, C. T., Osborne, J., & Nielsen, D.** (2011). *An all configurations approach for detecting hidden-additivity in two-way unreplicated experiments* (Technical Report No. 2636). North Carolina State University.

Intellectual Property Disclosures, Patents, and Software Developed

1. Mittelman, D. A., & **Franck, C. T.** (2014, April). System and method for genotyping using informed error profiles. Retrieved from <http://www.freepatentsonline.com/y2014/0114582.html>
2. Osborne, J. A., **Franck, C. T., & Choi, B.** *hiddenf: the all-configurations, maximum-interaction F-test for hidden additivity*. R package on the Comprehensive R Archive Network.
3. Porter, E. M., Keefe, M. J., **Franck, C. T., & Ferreira, M. A. R.** *ref.ICAR: Objective Bayes Intrinsic Conditional Autoregressive Model for Areal Data*. R package on the Comprehensive R Archive Network.
4. Metzger, T. A., & **Franck, C. T.** *slgf: Bayesian Model Selection with Suspected Latent Grouping Factors*. R package on the Comprehensive R Archive Network.

GRANTS

1. NIH: "Validation and application of wearable sensors for capturing kinematic responses to real-world losses of balance among balance-impaired older adults" PI: Madigan, M.L., Role: Statistician. (09/01/2022-05/31/2025)
2. US Department of Defense: "AI Model Certification in Operational Environments" PI: Freeman, L.J., Role: Co-PI. (01/11/2021- 03/15/2022)

3. US Army Research Lab: "Maven Test and Evaluation Research (continuation)" PI: Freeman, L.J., Role: Co-PI. (08/01/2020- 05/31/2021)
4. NIH/NIDA: "Abuse Liability of Reduced Nicotine Content Cigarettes Within a Complex Tobacco Marketplace" PI: Bickel, W.K., Role: Co-PI. (08/15/2016-05/31/2021)
5. US Army Research Lab (subcontract through Carnegie Mellon): "Maven Test & Evaluation Research - Determining the Sufficient Test Dataset for Algorithm Acceptance" PI: Freeman, L.J., Role: Co-PI. (11/01/2019-07/31/2020)
6. Virginia Tech College of Science Dean's Discovery Fund: "Spatial Analytics Platform" PI: Franck, C.T., Co-PI: Ferreira, M.A.R. (05/2018-08/2019)
7. NIH: "Delay Discounting as a Target for Self-Regulation in Prediabetes" UH2 DK109543 01. PI: Epstein, L.H., & Bickel, W.K., Role: Statistician. (09/2015-08/2018)
8. NIH/NIDA: "Self-Control Improvement Intervention (SCII): Improving Abstinence in Smokers" R01 DA034755 01A1. PI: Bickel, W.K., Role: Statistician. (07/2013-06/2018)
9. NIH/NIAAA: "The Repair of Self-Control in Alcohol Dependence: Working Memory and Real Time fMRI" R01AA021529-01A1. PI: Bickel, W.K., & LaConte, S.M., Role: Statistician. (09/2013-05/2018)
10. NIH/NCI: "The Social Interactome of Recovery: Social Media as Therapy Development" 1R01 DA039456 01. PI: Bickel, W.K., Role: Statistician. (09/2014-08/2017)
11. NIH/NCI: "Models for Tobacco Product Evaluation" 1U19CA157345-01A1. PI: Hatsukami, D.K., & Shields, P.C., Role: Statistician. (09/2012-08/2017)
12. NIH/NIMHD: "RITCh: Reducing Socioeconomic Disparities in Tobacco Dependence Treatment Outcomes" 1R01MD007054-01. PI: Sheffer, C.E., Role: Statistician. (07/2012-01/2017)
13. Carilion Medical Center: "Evaluation of the Utility of Telemetry in Patients Admitted for Chest Pain Who Are at Low Risk for Acute Coronary Syndrome" PI: Franck, C.T. (subcontract), Role: Principal Investigator. (10/2015-10/2016)
14. NIH: "Enhancing Relapse Prevention for Smoking Cessation with rTMS" R21CA17881301A. PI: Sheffer, C.E., Role: Statistician. (09/2014-08/2016)
15. NIH/NIDA: "Inter-Temporal Trade-offs in the Risky Decisions of Cocaine Addicts" R01 DA030241 01. PI: Bickel, W.K., Role: Statistician. (07/2010-03/2016)
16. Hanley Wood: "Improving the Value of the Reporting and Intelligence of the Nation's Door, Window, and Skylight Manufacturers" 14-0441-08. PI: McCoy, A.P., Role: Statistician. (08/2013-07/2015)
17. Housing Virginia: "The Impact of Energy Efficiency Construction for LIHTC Housing in Virginia" 14-0395-08. PI: McCoy, A.P., Role: Statistician. (11/2013-10/2014)
18. NIH/NIDA: "Executive Function Therapy for Stimulant Addiction" R01 DA024080-01. PI: Bickel, W.K., Role: Statistician. (09/2008-06/2014)
19. NIH/NIDA: "Executive Function Therapy for Stimulant Addiction (ARRA Supplement)" R01 DA024080-04S1. PI: Bickel, W.K., Role: Statistician. (09/2008-06/2014)
20. HUD Grant: "Impact of Market Behavior on the Adoption and Diffusion of Innovative Green Building Technologies" 10814146. PI: McCoy, A.P., Role: Statistician. (01/2012-01/2014)

INVITED PRESENTATIONS AND SYMPOSIA

1. **Franck, C. T.** (2024 August). *The Responsible Emboldening of Probability Forecasts*. Keynote presentation at the 6th International Conference on Statistics: Theory and Applications, Barcelona, Spain.
2. **Franck, C.T.** (2023 May). *Model Uncertainty, Selection, and Averaging in the Analysis of Discounting Data*. Invited in-person conference talk for the Society for the Quantitative Analysis of Behavior, Denver, Colorado, United States.
3. **Franck, C.T.** (2023 October). *Approximate Bayesian Model Selection as an Alternative to Classical Hypothesis Testing: Writing Outside of the Statistical Literature*. Invited Webinar for the WebENAR seminar series.
4. **Franck, C.T.** (2023 May). *Writing About Alternatives to Classical Hypothesis Testing Outside of the Statistical Literature: Approximate Bayesian Model Selection Applied to a Biomechanics Study*. Invited Webinar for the iTHRIV Biostatistics, Epidemiology, and Research Design Seminar Series.
5. **Franck, C.T.** (2023 March). *Approximate Bayesian Model Selection as an Alternative to Classical Hypothesis Testing: Writing Outside of the Statistical Literature*. Invited in-person National Institute of Allergy and Infectious Diseases (NIAID) seminar, Bethesda, MD, United States.
6. **Franck, C.T.** (2022 October). *A demonstration of two-stage analysis of delay discounting data using R*. Invited Webinar for the Association for Behavior Analysis International (ABAI).
7. **Franck, C.T.** (2022, June). *An Introduction to Model Uncertainty and Averaging for Categorical Data Analysis*. Invited Webinar for American Statistical Association's Section on Statistics in Defense and National Security (SDNS).
8. **Franck, C.T.** (2022, April). *Categorical Data Analysis*. Invited short course for DATAWorks, Alexandria, Virginia.
9. **Franck, C. T.** (2020, September). *Data journalism, statistical methodology, and the Academy Awards: A case study*. Invited talk, Department of Statistics at Virginia Tech, held virtually.
10. **Franck, C. T.** (2020, August). *Hiding in plain sight: Latent grouping factors in linear models*. Keynote talk, 2nd International Conference on Statistics: Theory and Applications (ICSTA'20), originally planned for Prague, Czech Republic, held virtually.
11. **Franck, C. T.** (2019). *Detection of hidden additivity and inference under model uncertainty for unreplicated factorial studies via Bayesian model selection and averaging*. Technometrics Invited Talk, Spring Research Conference at Virginia Tech, Blacksburg, VA, United States.
12. **Franck, C.T.** (2019, April). *Categorical Data Analysis*. Invited short course for DATAWorks, Alexandria, Virginia.
13. **Franck, C. T.** (2019). *The primordial soup for Bayesian analysis in collaborative settings: Technical skill, communication, and trust*. Invited paper, Joint Statistical Meetings, Denver, CO, United States.
14. **Franck, C. T.** (2019). *Assessing Bayes factor surfaces using interactive visualization and computer surrogate modeling*. Invited talk, International Conference on Statistics: Theory and Applications, Lisbon, Portugal.

15. **Franck, C. T.** (2019). *Assessing Bayes factor surfaces using interactive visualization and computer surrogate modeling*. Invited talk, Department of Applied and Computational Mathematics and Statistics at Notre Dame, South Bend, IN, United States.
16. **Franck, C. T.** (2019). *Assessing the sensitivities of p-values and Bayes factors for hypothesis testing and model selection*. Invited talk, Department of Mathematics and Statistics at James Madison University, Harrisonburg, VA, United States.
17. **Franck, C. T., Keefe, M. J., Porter, E. M., & Ferreira, M. A. R.** (2018). *Objective Bayesian analysis for Gaussian hierarchical models with intrinsic conditional autoregressive priors*. Invited talk, CMStatistics, Pisa, Italy.
18. **Franck, C. T. & Gramacy, R. B.** (2018, October). *Assessing Bayes factor surfaces using interactive visualization and computer surrogate modeling*. Invited talk, Statistical and Applied Mathematical Sciences Institute Webinar, held virtually.
19. **Franck, C. T.** (2018, September). *Detection of hidden additivity and inference under model uncertainty for unreplicated factorial studies via Bayesian model selection and averaging*. Invited talk, Department of Mathematics and Statistics at South Dakota State University, Brookings, SD, United States.
20. **Franck, C. T.** (2016, October). *Detecting hidden additivity in two-way unreplicated studies*. Invited talk, Department of Statistics at University of California, Riverside, Riverside, CA, United States.
21. **Franck C. T.** (2016). *Characterization of delay discounting using multiple models and effective delay 50 – A Goldilocks dilemma*. Invited talk, North Carolina State University Statistics 75th Anniversary Conference, Raleigh, NC, United States.
22. **Franck, C. T.** (2016). *Characterization of delay discounting using multiple models and effective delay 50*. Editor's Choice invited preeminent tutorial, Journal of Experimental Analysis of Behavior, Society for the Quantitative Analyses of Behavior, Chicago, IL, United States.
23. **Franck, C. T., Keefe, M. J., Woodall, W. H., & Ferreira, M. A. R.** (2015). *A study of foreclosures from 2005-2014 using statistical monitoring and disease mapping approaches*. Invited talk, Social and Decision Analytics Laboratory, Arlington, VA, United States.
24. **Franck, C. T.** (2013). *An approach for large scale statistical collaboration in the university setting*. Invited talk, Department of Statistics at North Carolina State University, Raleigh, NC, United States.

PRESENTATIONS

1. **Franck C.T.** (2023, August). *Detecting suspected latent grouping factors via Bayesian model selection*. Topic contributed Talk, Joint Statistical Meetings, Ontario, Canada.
2. **Franck, C.T.** (2022, August). *Data Journalism, Statistical Methodology, and the Academy Awards: A Case Study*. Contributed talk, Joint Statistical Meetings, Washington DC, United States.
3. **Franck, C.T.** (2020, August). *A practical assessment of sensitivities in Bayes factors using interactive visualization and computer surrogate modeling*. Contributed talk, Joint Statistical Meetings, originally planned for Philadelphia, PA, United States, held virtually.
4. **Franck, C. T.** (2019, February). *A practical assessment of the sensitivities of Bayesian*

- model selection*. Concurrent session presentation, Conference on Statistical Practice, New Orleans, LA, United States.
5. **Franck, C. T.** (2018, August). *Statistical inference for interaction effects in unreplicated studies via Bayesian model averaging*. Contributed paper presentation, Joint Statistical Meetings, Vancouver, BC, Canada.
 6. **Franck, C. T.** (2017, August). *A study of delay discounting using Bayesian model selection*. Contributed paper presentation, Joint Statistical Meetings, Baltimore, MD, United States.
 7. **Franck, C. T.** (2016, August). *Detecting hidden additivity in unreplicated studies using Bayesian model selection*. Contributed paper presentation, Joint Statistical Meetings, Chicago, IL, United States.
 8. **Franck, C. T.** (2016, February). *Can educational cyberinfrastructure empower non-statisticians with Bayesian methodology?* Contributed talk, ASA Conference on Statistical Practice, San Diego, CA, United States.
 9. **Franck, C. T., & Osborne, J. A.** (2015, August). *Testing for hidden additivity in factorial experiments using the hiddenf package in R*. Contributed paper presentation, Joint Statistical Meetings, Seattle, WA, United States.
 10. **Franck, C. T.** (2014). *The research track: Possibilities and risks along the promotion path for collaborating statisticians in academia*. Topic contributed panel discussion, Joint Statistical Meetings, Boston, MA, United States.
 11. **Franck, C. T.** (2013). *Wins, losses, and lessons as an early-career statistician collaborating and teaching in university, research institute, and medical school settings*. Topic contributed paper presentation, Joint Statistical Meetings, Montreal, Canada.
 12. **Franck, C. T.** (2011). *An all configurations approach to testing for latent group-based interaction effects in two-way unreplicated experiments*. Contributed paper presentation, Joint Statistical Meetings, Miami, FL, United States.

POSTERS

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1. **Franck, C. T., Guthrie, A. P., Vennos, A., Mueller, W. G., Woodall, W. H., Driscoll, A. R.** (2024 August). Recent developments in the calibration of probability forecasts. Invited poster at the Joint Statistical Meetings, Portland, OR, United States.
 2. **Franck, C. T., Madigan, M. L. & Lazar, L.** (2023 February). Writing about alternatives to classical hypothesis testing outside of the statistical literature: Bayesian model selection and biomechanics. 2023 Conference on Statistical Practice, San Francisco, CA, United States.
 3. **Franck, C. T.** (2018, April). *An introduction to Bayesian reasoning for the analysis of delay discounting data*. Poster presentation, 44th Association for Behavior Analysis International Conference, San Diego, CA, United States.
 4. **Franck, C. T.** (2017, February). *Expanding the appeal of model selection using mixture priors to incorporate expert opinion: A behavioral economic case study*. Poster presentation, Conference on Statistical Practice, Jacksonville, FL, United States.
 5. **Franck, C. T., Highnam, G., Leman, S. C., & Mittelman, D. A.** (2012). *Characterizing genetic variation from high-throughput sequencing data using Dirichlet process Gaussian mixture models*. Poster presentation, Personal Genomes and Medical Genomics, Cold Spring Harbor, NY, United States.
 6. **Franck, C. T., Highnam, G., Martin, A., & Mittelman, D. A.** (2012). *A Bayesian method for*

genotyping tandem repeats from high-throughput resequencing data using error profiles informed by sequence and read characteristics. Poster presentation, Biology of Genomes, Cold Spring Harbor, NY, United States.

7. **Franck, C. T.**, Koffarnus, M. N., House, L. L., Jarmolowicz, D. P., Mueller, E. T., & Bickel, W. K. (2012). *Characterizing heterogeneity in discounting patterns among cocaine users via Bayesian model selection*. Poster presentation, Carilion Research Day, Roanoke, VA, United States.