MARLY | GOTTI

EDUCATION

Ph.D. in Mathematics, Advisor: Prof. Peter Sin — December 2019
Graduate Student Fellowship (GSF)
University of Florida, FL

M.Sc. in Mathematics — May 2017
University of Florida, FL

B.A. in Mathematics — May 2014
University of Southern California, CA & University of Florida, FL

TECHNICAL SKILLS

R, shiny, quarto, rmarkdown, plotly, dplyr, Snowflake, Posit Connect/Workbench/Package Manager, ggplot2, Docker, SQL, ETLs, Jira, CI/CD

CERTIFICATIONS

- Certified Shiny Instructor by RStudio.
- Certified Tidyverse Instructor by RStudio.

WORK EXPERIENCE

Data Scientist, Finance Decision Support, **Apple Inc.**, Cupertino, CA — 2022 - Current

Utilize R and Shiny for in-depth analysis of intricate datasets, extracting critical insights to bolster finance decision-making. Develop and deploy interactive visual tools and applications using Shiny, showcasing data-driven insights, predictive models, and key metrics. Execute rigorous exploratory data analysis to discern core patterns and trends. Foster strong collaboration with cross-functional teams and stakeholders, encompassing business analysts, product managers, and fellow data scientists. Articulate analytical findings and insights to a diverse audience, ensuring clarity for both technical and non-technical stakeholders. Manage end-to-end data processing, encompassing extraction, cleansing, and preprocessing from various sources such as databases, APIs, and flat files.

Senior Data Scientist, Research & Development, **Biogen Inc.**, Cambridge, MA — 2019 - 2022

Lead analytical programming activities pertaining to biomarker data, clinical data, genomic data and other types of data analysis outside the typical analysis required for a clinical study report. Produce statistical specifications including but not limited to analysis datasets, simulations, statistical modeling, integration of biomarker analyses with interpretation, and contribution to abstracts and papers. Develop/maintain analytical clinical tools involving the R package Shiny and/or other statistical methods in support of enrollment into clinical trials.

Some of the statistical tools developed and/or contributed:

- SPARK: interactive statistical tool made in Shiny to further the SPARK clinical research study that investigates the effectiveness of BIIB054, a potential drug to treat Parkinson's disease.
- tidyCDISC: Shiny tool to facilitate the creation of custom tables and figures from ADaM datasets (GitHub link: tidyCDISC).
- MMR Reporting Tool: Shiny dashboard for medical monitoring, reviewing, and reporting.
- Risk Assessment: interactive web application that provides a front end for a collection of metrics for R packages via the riskmetric package. It includes visualizations and comparison metrics. The app is aimed to help in the validation of R packages in the context of regulated industries (GitHub link: Risk Assessment).
- In-Vivo ANOVA Application: statistical Shiny dashboard to help users perform exploratory analysis, assumption checks, ANOVA, multiple comparison, and power analysis.

Tidymodels Intern, **Posit**, Boston, MA Summer 2019

Project: Develop a modeling package in R (applicable) that implements different applicability domain methods, i.e., methods that determine the sample space in which a model can make reliable predictions; Mentor: Max Kuhn (RStudio Summer Interns).

Application Developer Analyst, **University of Florida**, College of Medicine, CTSI, FL 2017 - 2019

Work as part of a research support unit specializing in the science of information, in particular, supporting research at all stages with services such as data collection/cleaning/analysis using R; software (module) extensions for REDCap using PHP/Python/JavaScript; software deployment and maintenance for WebCAMP; local software testing using Vagrant/Docker; Linux servers administration (CTSI homepage).

Adjunct Assistant Professor, Department of Mathematics, **Santa Fe College**, FL Summer 2016

Set academic goals and prepared lectures, tests, and assignments. Assessed the relevance and impact of various lessons; revised and improved lesson formats. Acted as an advisor and counselor to students.

Researcher, Department of Mathematics, **University of Hawai'i at Hilo**, HI 2013, 2015

Conducted research in factorization theory as an undergraduate student and returned to the program two years later to guide/instruct a team of undergraduate students throughout the research process. Presented the findings of these two summers at the Joint Mathematics Meetings of January 2014 and 2016.

Teaching Assistant, Calculus, Department of Mathematics, **University of Florida**, FL 2014-2015

Designed and implemented lesson plans. Tutored and assisted students with assignments and concepts.

Software Engineer Intern, **Ultimate Software**, FL Summer 2014

Developed comprehensive suites for automation test plans and added test cases to existing testing framework (Echo, a Selenium-based testing framework). Ensured traceability and automation in managing application releases between Non-Production and Production environments. Identified and removed application risks; maintained C# programs and databases. Cultivated the set of principles native to Agile development and tracked customers cases using the Salesforce enterprise.

RESEARCH

1. *On the local k-elasticities of Puiseux monoids* International Journal of Algebra and Computation, 29(01), pp. 147-158, 2019, doi:10.1142/S0218196718500662.
2. *How do elements really factor in $\mathbb{Z}[\sqrt{-5}]$?* with S. T. Chapman and F. Gotti, Advances in Commutative Algebra, Springer Trends in Mathematics (Eds. A. Badawi and J. Coykendall), pp. 171-195, 2019, doi:10.1007/978-981-13-7028-1.
3. *Atomicity and boundedness of monotone Puiseux monoids* with F. Gotti, Semigroup Forum, Springer, 96(3), pp. 536–552, 2017, doi:10.1007/s00233-017-9899-9.
4. *The catenary degrees of elements in numerical monoids generated by arithmetic sequences* with S.T. Chapman, A. Miller, C. Miller, and D. Patel, Communications in Algebra, 45(12), pp. 5443-5452, 2017, doi:10.1080/00927872.2017.1310878.
5. *The catenary and tame degrees on a numerical monoid are eventually periodic* with S. T. Chapman, A. Miller, C. Miller, and D. Patel, Journal of the Australian Mathematical Society, 97(3), pp. 289-300, 2014, doi:10.1017/S1446788714000330.
6. *On the molecules of numerical semigroups, Puiseux monoids, and Puiseux algebras* with F. Gotti, Numerical Semigroups (Eds. V. Barucci, S. T. Chapman, M. D'Anna, and R. Fröberg), Springer INdAM Series, Vol. 40, Switzerland, 2020, arXiv:1702.08270.
7. *Factorization invariants of Puiseux monoids generated by geometric sequences* with S. T. Chapman and F. Gotti, Communications in Algebra, Vol. 48 (2020) 380-396, doi:10.1080/00927872.2019.1646269.
8. *Atomicity and density of Puiseux monoids* with M. Bras-Amoros, Communications in Algebra, Vol. 49 (2021) 1560-1570, doi:10.1080/00927872.2020.1840574.
9. *When is a Puiseux monoid atomic?* with S. T. Chapman and F. Gotti, The American Mathematical Monthly, Vol. 128 (2021) 302-321, doi:10.1080/00029890.2021.1865064, arxiv:1908.09227.
10. *Paving the Way for Regulatory Submissions Using R: the Risk Assessment Application* with A. Clark, D. Kelkhoff, R. Krajcik, et al. JSM Proceedings, Statistical Computing Section. Alexandria, VA: American Statistical Association. 1121-1131.
11. *On the Set of Molecules of Numerical and Puiseux Monoids* with M. M. Tirador, In: Rings, Monoids and Module Theory, Springer Proceedings in Mathematics & Statistics book series (Eds. A. Badawi and J. Coykendall). Springer, Singapore. Vol. 382 (2022) 111–125, doi:10.1007/978-981-16-8422-7_5.
12. *Factorizations in reciprocal Puiseux monoids* with C. Aguilera and A. Hamelberg (submitted). Preprint on arxiv:2112.04048.

PRESENTATIONS

Presentation: R Consortium - 2022
Presenting: "Risk Assessment Shiny App – Update from the R Validation Hub"

Conference: JSM - 2021
Presenting: "Paving the Way for Regulatory Submissions Using R: the Risk Assessment Shiny Application "

Conference: R/Pharma - 2021
Presenting: "Performing a risk assessment of R packages using the Risk Assessment Shiny Application"
Cohost: Andy Nicholls

Conference: rstudio::global(2021)
Presenting: "Risk Assessment Tools: R Validation Hub Initiatives"
Recorded Video: RStudio - R in Pharma Session

Conference: R/Pharma - 2020
Workshop: "Implementing a Risk-based Approach to R Validation" [Workshop Site]
Cohost: Andy Nicholls
Recorded Video: YouTube Link

Conference: R/Pharma - 2020
Presenting: "tidyCDISC: An Open Source Platform in R to Analyze Clinical Trial Data"
Copresenter: Maya Gans
Recorded Video: YouTube Link

Conference: R/Medicine - 2020
Presenting: "An Open Source ANOVA and Power Analysis Tool Made in shiny"
Copresenter: Jake Gagnon
Recorded Video: YouTube Link

Conference: R/Medicine - 2020
Presenting: "tidyCDISC: An Open Source Platform in R to Analyze Clinical Trial Data"
Copresenter: Maya Gans
Recorded Video: YouTube Link

Conference: International Conference on Mathematics and Statistics - 2020
Location: American University of Sharjah, Sharjah, UAE
Presenting: "When is a Puiseux Monoid Atomic?"

Colloquium: Department of Mathematics and Statistics Colloquiums - 2019
Location: Sam Houston State University, Huntsville, TX
Presenting: "Applicability Domain Methods"

Research Retreat: NSF-AGEP Research Exchange Retreat - 2019
Location: Stanford University, Stanford, CA
Presenting: "Applicability Domain in Data Science"

Conference: R/Pharma - 2019
Location: Harvard University, Cambridge, MA
Presenting: "This one is not like the others: Applicability Domain methods"
Copresenter: Max Kuhn

Conference: AMS Joint Central and Western Sectional Meeting - 2019:
"Factorization and arithmetic properties of integral domains and monoids"
Location: University of Hawai'i at Manoa, Honolulu, HI
Presenting: "Cyclic rational semirings"

Conference: Florida Women in Mathematics Day (FWIMD) - 2019
Location: Florida Atlantic University, Boca Raton, FL
Presenting: "How do elements really factor in $\mathbb{Z}[\sqrt{-5}]$?"

Conference: Joint Mathematics Meetings - 2019
Location: Baltimore Convention Center, Baltimore, MD
Presenting: "The elasticity and union of sets of lengths of Puiseux monoids"

Conference: INdAM meeting: International meeting on numerical semigroups - 2018
Location: Il Palazzone, Cortona, Italy
Presenting: "On the Molecules of Puiseux Monoids"

Conference: Infinite Possibilities Conference - 2018
Location: Howard University, Washington, DC
Presenting: "On the Atomicity of Monotone Puiseux Monoids"

Meeting: Master's Thesis - 2016
Location: University of Florida, Gainesville, FL
Presenting: Presented my thesis to a mathematics graduate committee as part of the final stages of my master's degree.

Conference: Joint Mathematics Meetings - 2016
Location: Washington State Convention Center, Seattle, WA
Presenting: "On the Catenary Degree of Numerical Monoids Generated by a Generalized Arithmetic Sequence"

Symposium: PURE Math Symposium - 2015
Location: University of Hawai'i at Hilo, Hilo, HI
Presenting: "On the Catenary Degrees of Numerical Monoids Generated by Generalized Arithmetic Sequences"

Conference: Joint Mathematics Meetings - 2014
Location: Baltimore Convention Center, Baltimore, MD
Presenting: "On the Catenary Degrees of Numerical Monoids Generated by Generalized Arithmetic Sequences"

Symposium: PURE Math Symposium - 2013
Location: University of Hawai'i at Hilo, Hilo, HI
Presenting: "The Catenary Degree of Elements in Numerical Monoids"

TEACHING

Adjunct Assistant Professor - Summer 2016
MAC1105 - College Algebra
Santa Fe College, FL

Teaching Assistant - Spring 2015
MAC2311 - Calculus
University of Florida, FL

Teaching Assistant - Fall 2014
MAC2311 - Calculus
University of Florida, FL

REFEREE DUTIES

- Research paper referee for the American Mathematical Monthly.
- Research paper referee for the International Conference on Physics, Mathematics and Statistics, ICPMS.
- Research paper referee for the Annali di Matematica Pura ed Applicata.

OTHER PROFESSIONAL ACTIVITIES

- Co-author of the ASA Biopharmaceutical report *Risk Assessment of R Packages: Learnings and Reflections* published in 2022.
- Co-organizer of the 2021 JSM Contributed Session titled Tools to Enable the Use of R by the Biopharmaceutical Industry in a Regulatory Setting.
- Teaching assistant for the *Intro to Machine Learning with Tidymodels* workshop by Alison Hill at R/Medicine 2020.
- Teaching assistant for the *Applied Machine Learning* workshop by Max Kuhn at the rstudio::conf 2020.
- Co-organizer of FWIMD: Florida Women in Mathematics Day, 2020.
- Executive committee member of the R Validation Hub.
- Teaching assistant for the *Machine Learning* workshop by Max Kuhn at R/Pharma 2019.