

# Charles Margossian

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## Education

- 2017–present **Ph.D. Statistics**, *Columbia University*, New York, NY.
- 2017–2020 **M.Phil. Statistics**, *Columbia University*, New York, NY.
- 2017–2019 **M.A. Statistics**, *Columbia University*, New York, NY.
- 2011–2015 **B.Sci. Physics (intensive track)**, *Yale University*, New Haven, CT.
- 2009–2011 **Baccalauréat Scientifique**, *Ecole Jeanine Manuel (High school)*, Paris, France, Mention *très bien*.

## Experience

- Summer 2019 **Visiting Doctoral Student**, *Aalto University, Department of Computer Science*, Probabilistic Machine Learning group, Helsinki, Finland.
- 2016–present **Core Developer**, *Stan Development Team*.
- 2016–2017 **Visiting Scientist**, *Metrum Research Group LLC*, Cambridge, MA.
- 2015–2016 **Pharmacometrics Bootcamp**, *Metrum Research Group LLC*, Tariffville, CT.
- 2013–2015 **Researcher**, *Yale Department of Astronomy*, New Haven, CT.
- Summer 2014 **Patent Law, Technical Specialist**, *Leinweber und Zimmermann*, Munich, Germany.

## Awards

- 2017 **Dean's Fellowship**, *Columbia Department of Statistics*.
- 2010 **Yale Book Award**.

## Academic service

Peer reviewer for the *Journal of pharmacokinetics and pharmacodynamics*.  
Student representative for the PhD program in statistics at Columbia University.

## Teaching Experience

- March 2020, **Instructor**, *Building, fitting, and criticizing Bayesian PK/PD models*, (one day workshop), University of Buffalo, School of Pharmacy, Buffalo, NY.
- March 2019

- March 2020, **Invited Lecturer**, *Probability and Bayes*, University of Buffalo, School of Pharmacy, PHC 506: Biometry in Pharmaceutics, Buffalo, NY.
- March 2019, **Invited Lecturer**, *Probability and Bayes*, University of Buffalo, School of Pharmacy, PHC 506: Biometry in Pharmaceutics, Buffalo, NY.
- March 2018
- Feb 2020, **Instructor**, *Stan for the people: two days introductory workshop on Bayesian modeling*, McGill University, Montreal, Canada.
- January 2019
- August 2019 **Co-instructor**, *Population and ODE-based models using Stan and Torsten*, (two days workshop), Stan Conference 2019, Cambridge, UK.
- January 2018 **Instructor**, *How to Develop for the Stan C++ Core Language*, Stan Conference 2018, Pacific Grove, CA.
- April 2017 **Invited Lecturer**, *Introduction to Bayesian Data Analysis with Stan*, Harvard University, STAT 220: Bayesian Statistics, Cambridge, MA.
- Fall 2019 **Teacher Assistant**, *Foundation of Graphical Models*, STAT 6701 (PhD level), Columbia University.  
New York, NY
- Spring 2019 **Teacher Assistant**, *Statistical inference*, STAT 4/5204, Columbia University.  
New York, NY
- Fall 2018 **Teacher Assistant**, *Statistical Computing and Introduction to Data Science*, STAT 4206, Columbia University.  
New York, NY
- Spring 2018 **Teacher Assistant**, *Bayesian Statistics*, STAT 5/5224, Columbia University.  
New York, NY
- Fall 2017 **Teacher Assistant**, *Linear Regression Models*, STAT 4205, Columbia University.  
New York, NY
- September 2017 **Teacher Assistant**, *Stan for Physics*, Massachusetts Institute of Technology, Cambridge, MA.
- June 2017 **Teacher Assistant**, *Getting Started with Bayesian PKPD Modeling using Stan and Torsten*, Population Approach Group in Europe 26, Budapest, Hungary.
- October 2016 **Teacher Assistant**, *Getting Started with Bayesian PKPD Modeling using Stan*, American Conference on Pharmacometrics 7, Bellevue, WA.
- October 2015 **Teacher Assistant**, *Getting Started with Bayesian PKPD Modeling using Stan*, American Conference on Pharmacometrics 6, Arlington, VA.
- 2013–2015 **Peer Tutor**, *Science, Technology, And Research Scholars (STARS) program*, New Haven, CT.

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## Presentations

- April 2020 **Laplace approximation for speeding up the computation of multilevel models**, MRP conference, Columbia University, New York, NY.

- March 2020 **Building a probabilistic programming language to diagnose our inference**, Special seminar, University of Buffalo, School of Pharmacy.
- July 2018 **Understanding automatic differentiation to improve performance**, Stan for Pharmacometrics Day 2018, Université Paris Diderot, School of Medicine, Paris, France.
- January 2018 **Computing steady states with Stan's nonlinear algebraic solver**, Stan Conference 2018, Pacific Grove, CA.
- June 2017 **L'Avenir de Stan en pharmacométrie**, Université Paris Diderot, School of Medicine, Paris, France.
- January 2017 **Differential equations based models in Stan**, Stan Conference, Columbia University, New York, NY.
- November 2016 **Differential equations based models in Stan**, Stan Meetup in Boston, Harvard University, Cambridge, MA.
- February 2016 **Practice (and malpractices!) of Bayesian analysis**, *Metrum Journal Minute*, Tariffville, CT.
- March 2015 **How stars and planets Interact: testing the effects of close-in giant planets on stellar magnetic activity**, *Davenport Mellon Forum*, Yale University, New Haven, CT.
- June 2014 **Detecting exoplanets**, *Ecole Jeanine Manuel (High School)*, Paris, France.

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## Publications and Preprints

- [1] Charles C Margossian, Aki Vehtari, Daniel Simpson, and Raj Agrawal. Hamiltonian Monte Carlo using an embedded Laplace approximation. *arXiv:2004.12550*, April 2020.
- [2] Anthony Hauser, Michel J Couston, Charles C Margossian, Garyfallos Konstantinoudis, Nicola Low, Christian L Althaus, and Julien Riou. Estimation of SARS-CoV-2 mortality during the early stages of an epidemic: a modeling study in Hubei, China and northern Italy. *medRxiv:2020.03.04.20031104*, 2020.
- [3] Michael Betancourt, Charles C Margossian, and Vianey Leos-Barajas. The Discrete Adjoint Method: Efficient Derivatives for Functions of Discrete Sequences. *arXiv:2002.00326*, February 2020.
- [4] Charles C Margossian. A Review of automatic differentiation and its efficient implementation. *Wiley interdisciplinary reviews: data mining and knowledge discovery*, 9, March 2019.
- [5] Charles C Margossian. Computing Steady States with Stan's Nonlinear Algebraic Solver. In *StanCon 2018*, January 2018.
- [6] Charles C Margossian and William R Gillespie. Gaining Efficiency by Combining

Analytical and Numerical Methods to Solve ODEs: Implementation in Stan and Application to Bayesian PK/PD. *Journal of Pharmacokinetics and Pharmacodynamics*, 44, October 2017.

- [7] Charles C Margossian and William R Gillespie. Differential Equation Based Models in Stan. In *StanCon 2017*, January 2017.
- [8] Charles C Margossian and William R Gillespie. Stan Functions for Pharmacometrics Modeling. *Journal of Pharmacokinetics and Pharmacodynamics*, 43, October 2016.
- [9] Joseph R Schmitt, Eric Agol, Katherine M Deck, Leslie A Rogers, J Zachary Gazak, Debra A Fischer, Ji Wang, Matthew J Holman, Kian J Jek, Charles Margossian, Mark R Omohundor, Troy Winarski, John M Brewer, Matthew J Giguere, Chris Lintott, Stuart Lynn, Michael Parrish, Kevin Schawinski, Megan E Schwamb, Robert Simpson, and Arfon M Smith. Planet Hunters. VII. Discovery of a new low-mass, low-density planet (PH3 C) orbiting KEPLER-289 with mass measurements of two additional Planets (PH3 B and D). *Astrophysical Journal*, 795(2), October 2014.

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## Softwares

- [1] Stan Development Team. *Stan: A Probabilistic Programing Language*. mc-stan.org.
- [2] Charles C Margossian, William R Gillespie, and Yi Zhang. *Torsten: A Bayesian Pharmacometrics Model Library for Stan*. Metrum Research Group, <https://github.com/metrumrg/example-models>.
- [3] Kyle T Baron, Alan C Hindmarsh, Linda R Petzold, William R Gillespie, Charles C Margossian, and Devin Pastoor. *mrgsolve: Simulation from ODE-Based Population PK/PD and System Pharmacology Models*. Metrum Research Group, <https://mrgsolve.github.io/>.

*Modified March 2020*