


## Sally Paganin, Ph.D.

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### CONTACT INFORMATION

[Department of Biostatistics](#)

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### RESEARCH INTERESTS

Bayesian nonparametrics, Computational Statistics, Hierarchical models, Item Response Theory, Partition Models, Models for Latent Variables, Data visualization.

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### CURRENT POSITION

**Research Fellow** at [Harvard T.H. Chan School of Public Health](#) (since March 2021)  
[Department of Biostatistics](#), working with [Jeff Miller](#) on statistical methods for early cancer detection.

### PAST POSITIONS

**Postdoctoral Researcher** at UC Berkeley (September 2019 – March 2021)  
Department of Statistics, Department of Environmental Science, Policy & Management  
statistical methodology, applications and algorithms development in [NIMBLE](#),  
collaborating with [Perry de Valpine](#) and [Chris Paciorek](#).

**Member of the core-team** developing the R [nimble](#) package.

### EDUCATION

[Università degli Studi di Padova](#), Padova, Italy  
[Department of Statistical Sciences](#)

2019 Ph.D. in Statistical Sciences

Thesis: Prior-driven cluster allocation in Bayesian mixture models  
Advisor: [Bruno Scarpa](#); Co-Advisor [Amy H. Herring](#)

2016 M.S. in Statistical Sciences

Thesis: Analysis of an insurance company sales structure: a Bayesian nonparametric model for a network of networks  
Advisor: [Bruno Scarpa](#); Co-advisor: [Daniele Durante](#)

2012 B.S. in Statistical Sciences and Information Technologies

Thesis: Bayesian nonparametric models based on Dirichlet Process  
Advisor: [Livio Finos](#); Co-advisor: Dario Solari

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### AWARDS

- Young researcher travel award, 2022 ISBA world meeting
  - 2022 PDA Research Symposium honorarium recipient (HSPH)
  - Bayesian Analysis Discussion Paper of March 2021 issue (Editorial Board's choice)
  - Young researcher travel award, 2018 ISBA world meeting
  - Travel award for COBAL V (2017), Guanajuato, Mexico
  - Young researcher travel award, 2016 ISBA world meeting
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### PUBLICATIONS

(\*) authors listed in alphabetical order

#### **Publications in refereed journals**

5. **Paganin, S.**, Paciorek, C., Wehrhahn, C., Rodriguez, A., Rabe-Hesketh, S., De Valpine, P. (2020+) Computational methods for Bayesian semiparametric item response theory models using NIMBLE. [arXiv preprint](#). (accepted at *Journal of Educational and Behavioral Statistics*)

4. de Valpine, P., **Paganin, S.**, Turek, D., (2022). [compareMCMCs: An R package for studying MCMC efficiency](#). *Journal of Open Source Software*, 7(69), 3844, doi:10.21105/joss.03844
3. **Paganin, S.**, Herring, A.H., Olshan A.F., Dunson, D.B. and The National Birth Defect Prevention Study. (2021) [Centered Partition Process: Informative Priors for Clustering \(with Discussion\)](#). *Bayesian Analysis*, 16(1), 301–370. doi:10.1214/20-BA1197
2. (\*) Aliverti, E., Paganin, S., Rigon, T. and Russo, M. (2019) Contributed discussion to “Latent nested nonparametric priors”. *Bayesian Analysis* 14, 4, 1303–1356
1. Durante, D., **Paganin, S.**, Scarpa, B. and Dunson, D.B. (2017) [Bayesian modeling of networks in complex business intelligence problems](#). *Journal of the Royal Statistical Society: Series C* 66, 555–580

### Book Chapters

1. (\*) Aliverti E., Forastiere L., Padellini T., Paganin S. and Wit E. (2018). Hierarchical Graphical Model for Learning Functional Network Determinants. “*Studies in Neural Data Science*”, Springer Proceedings in Mathematics & Statistics

### National conference proceedings (with peer-review)

- **Paganin, S.** (2021). Semiparametric IRT models for non-normal latent traits (pp. 178 - 181) *CLADAG 2021 Book of Abstracts and Short Papers*
- **Paganin, S.**, Paciorek C., de Valpine P. (2020). Bayesian IRT models in NIMBLE. (pp. 644 - 649) *Book of Short Papers SIS 2020*
- **Paganin, S.** (2019). Domain knowledge based priors for clustering. *Proceedings of the Conference of the Italian Statistical Society. “Smart Statistics for Smart Applications”*, Pearson
- **Paganin, S.** (2017). Modeling of complex network data for targeted marketing. *Proceedings of the Conference of the Italian Statistical Society. “Statistics and data Sciences: new challenges, new generations”*. Firenze University Press

### Under Review

- **Paganin, S.**, Russo, M., Scarpa, B. (2022+). A generalized partial credit model for network dependent latent traits with an application on modeling students’ ability.

## PRESENTATIONS

### Invited Seminars

- Fast Bayesian model assessment via calibrated posterior predictive p-values *University of Nottingham* (Statistics and Probability seminar), April 7, 2022.
- Centered Partition Processes: Informative Priors for Clustering *Millenium Nucleus Center for the Discovery of Structures in Complex Data Pontificia Universidad Católica de Chile* (online) October 8, 2021.
- Centered Partition Processes: Informative Priors for Clustering *UC Davis, Department of Statistics* (Spring seminars series), May 6, 2021.
- Centered Partition Process: Informative Priors for Clustering. *Bayesian Analysis - Discussion paper Webinar* <https://www.youtube.com/watch?v=V0zCB8doqlo> March 29, 2021.

### Invited talks

- Semiparametric IRT models for non-normal latent traits *Cladag 2021*, Online conference, September 9, 2021.
- Informative model-based clustering via Centered Partition Processes. *YoungStatS “One World webinar” - Developments in Bayesian Nonparametrics* virtual, April 21 2021.
- Modeling health surveys via semiparametric IRT models. *Bayesm:O*. Session on “Advances in Bayesian methods for medical data”, virtual, November 17, 2020.
- Prior-Driven Cluster Allocation in Bayesian Mixture Models. *JSM 2020*. j-ISBA organized session, virtual conference, August 03, 2020
- Domain knowledge based priors for clustering. *SIS 2019*. ySIS organized session. Milano, Italy. June 19, 2019
- Modeling of complex network data for targeted marketing. *SIS 2017*. Firenze, Italy. June 29, 2017

### Contributed talks

- A hierarchical Hidden Markov Model for cancer detection.  
*JSM 2022*. Washington D.C., August, 10 2022
- A hierarchical Hidden Markov Model for cancer detection.  
*ISBA 2022*. Montreal, Canada. July 1, 2022
- Statistics for early cancer detection.  
*PDA Research Symposium*. Harvard T.H. Chan School of Public Health, online. February 22, 2022
- Flexible model assessment via approximate calibrated posterior predictive p-values.  
*ISBA 2021*. Online conference. June 29, 2021
- Centering Exchangeable Partition Models.  
*IBC 2018*. Barcelona, Spain. July 10, 2018
- Bayesian modeling of networks in complex business intelligence problems.  
*COBAL V*. Cimat, Guanajuato, Mexico. June 8, 2017

### Poster presentations

- Flexible model assessment via approximate calibrated posterior predictive p-values .  
*ISBA 2021*. Online conference. June 29, 2021
  - Computational methods for Bayesian semiparametric Item Response Theory models.  
*WiDS Cambridge, 2021*. Online conference. March 11, 2021
  - Informative Bayesian Clustering for Mixture Models.  
*Advanced Statistics for Physics Discovery*. Padova, Italy. September 24, 2018
  - Centering Exchangeable Partition Models.  
*ISBA 2018*. Edinburgh, United Kingdom. June 27, 2018
  - Bayesian modeling of networks in complex business intelligence problems.  
*ISBA 2016*. Forte Village Resort Convention Center Sardinia, Italy. June 15, 2016
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### TEACHING & MENTORING EXPERIENCE

#### UC Berkeley

- Mentor for the [Undergraduate research mentorships in statistics](#) (Spring 2020).  
Mentee: Tianchi Liu. Project: *Building models and case studies using NIMBLE*.

#### Università degli Studi di Padova

- Thesis co-supervision: Claudia Stocchi (2021), master student in Statistical Sciences.
- *Statistical Methods for Insurance Marketing*. Invited lecture for the course of “Business Statistics” taught by Prof. [Mariangela Guidolin](#). (April 24, 2018 & online on November 24, 2020).
- Mentor at *Scegli con noi*. Orientation events for high schools students. (2014, 2015, 2016 editions) Campus Agripolis di Legnaro, Padova, Italy.
- *Advanced statistical inference* (M.Sc.), Year 2013/2014, Academic Tutor, Department of Statistical Sciences.
- *Introduction to real analysis* (B.Sc.), Year 2013/2014, Academic Tutor, Department of Statistical Sciences.

#### Short-courses

- [Programming With Hierarchical Statistical Models Using NIMBLE](#) (May 23, 2022). Full-day, hybrid short course during the 35th New England Statistics Symposium hosted at UConn.
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### VISITING PERIODS

- Mar. 2019 – Jun. 2019. *Research visit* at Department of Environmental Science, Policy & Management, UC Berkeley.
- Jan. 2018 – Mar. 2018. *Visiting Research Scholar* at the Department of Statistics, Duke University (NC, USA) under the supervision of Prof. Amy H. Herring
- Oct. 2016 – Jun. 2017. *Visiting Research Scholar* at the Department of Biostatistics University of North Carolina at Chapel Hill (NC, USA) under the supervision of Prof. Amy H. Herring
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### WORKSHOPS

- Introduction to Open Source GIS: QGIS, [GIF](#) UC Berkeley, April 3, 2020 (online)
  - [Start-Up Research](#). University of Siena, Italy, June 2017.  
2-days boot-camp where small research groups of young scholars, advised by senior researchers, worked on developing innovative methods and models to analyze a common dataset from the Neuroscience.
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## EDITORIAL ACTIVITY

### Associate Editor

from 06/2021 [The New England Journal of Statistics in Data Science](#) (Software section)

### Reviewer

(2022) Statistical Papers, Journal of Machine Learning.

(2021) BMJ, R Journal (2), JCGS, Harvard Data Science Review, Applied Psychological Measurements, Duke Dathaton.

(2020) BMJ, Statistical Papers, NSF proposal review, JOSS.

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## SERVICE TO PROFESSION

### Positions in scientific societies

- j-ISBA board, Treasurer (2020-2022)

### Organization of scientific events

- Scientific committee of [BayesComp 2023](#) (Levi, Finland).
- Session organizer, (with j-ISBA) at JSM 2022 “Advances in scalable Bayesian methods for spatial data”.
- Session organizer, (with j-ISBA) at ISBA 2022 “Advances in Bayesian methods for complex data”.
- Organizing committee of BAYSM 2021 (virtual conference).
- Organizing committee of ISBA 2021 World Meeting (virtual conference).
- assistance to organization, IT set-up and conduction of the [NIMBLE short course](#), June 3–5 2020, UC Berkeley (online workshop).

### Outreach

- regular contributor to the [ISBA Bulletin](#) (2021)
- volunteer for *Venetonight – La notte dei ricercatori*, Padova, Italy. (2015 – 2017)  
developed an online app interfacing with Twitter to track and display the event sentiment in real-time.
- volunteer for *StatistcAll*, Treviso, Italy. (2015)  
statistical games and activities to show the magic of statistics to kids and adults.

### Memberships

- International Society for Bayesian Analysis (ISBA); j-ISBA; New England Statistical Society.

## FUNDING

### Research projects

- *Reproducibility and Robustness of Dimensionality Reduction* (National Institute of Health)  
P.I. Amy H. Herring. Role: Researcher.
  - *NSF CDS&E-MSS Award #1622444 Expanding the Computational Statistics Toolbox for General Hierarchical Models* (National Science Foundation)  
P.I. Perry de Valpine. Role: Researcher.
  - *Statistical methods for cancer genomics and cell-free DNA analysis* (National Institute of Health)  
P.I. Jeffrey W. Miller. Role: Researcher.
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## WORK EXPERIENCE

- *Statistical consultant* for Azienda ULSS n.4. Analysis of relapsing rate after being in rehab facilities.
  - Jul. 2014 – Aug. 2015. *Marketing Analyst* at Generali Italia SPA (Mogliano Veneto)  
Data quality and gathering. Customer satisfaction analysis: definition of the sampling plan, questionnaires analysis, text analysis of online survey opinions. Reporting.
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## SOFTWARE

- COMPAREMCMCs. An R package for running, managing, and comparing results from different MCMC packages. <https://github.com/nimble-dev/compareMCMCs/>
  - Core-team of R NIMBLE package (reversible jump MCMC).
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## OTHER

### Programming

- Programming languages: R (advanced) practice of Rcpp, plyr/dplyr, ggplot2, shiny libraries. C/C++, SQL (good). JAVA, Python, Julia (base).
- O.S.: Linux (Fedora/Ubuntu), OSX, Windows and relative software.
- Other: practice of L<sup>A</sup>T<sub>E</sub>X, Sweave, Markdown for reporting, Git and Github as revision control system, Gimp/Illustrator for image processing.

### Languages

- Italian: native; English: fluent; French: basic; Spanish: basic.
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