Jean-Baptiste Tristan

PERSONAL INFORMATION

Email tristanj@bc.edu
Website https://jtristan.github.io/

EDUCATION

Ph.D. computer science, 2009
University of Paris 7, Paris, France

- Title: Formal Verification of Translation Validators
- Performed at INRIA (French Institute for Research in Computer Science and Automation)

M.Sc. computer science, 2006
Ecole Normale Superieure, Paris, France

Undergraduate studies
I obtained several French diplomas that do not correspond well to US diplomas

- "DEUG" in mathematics and computer science (University of Paris 7)
- "License" in computer science (University of Paris 7)
- "Magistere" in mathematics and computer science (Ecole Normale Superieure of Paris)

PROFESSIONAL POSITIONS

Amazon AWS, Boston, Massachusetts USA
Principal Applied Scientist **09/2022-present**
Boston College, Chestnut Hill, Massachusetts USA
Associate Professor **08/2020-05/2023**
Harvard University, Cambridge, Massachusetts USA
Visiting Lecturer **Fall 2019**
Oracle labs, Burlington, Massachusetts USA
Consulting Member of Technical Staff **06/2019-07/2020**
Oracle labs, Burlington, Massachusetts USA
Principal Member of Technical Staff **10/2015-06/2019**
Harvard University, Cambridge, Massachusetts USA
Visiting Lecturer **Fall 2015**
Oracle labs, Burlington, Massachusetts USA
Senior Member of Technical Staff **11/2011-10/2015**
Harvard University, Cambridge, Massachusetts USA
Postdoctoral fellow **11/2009 - 11/2011**
Microsoft research-INRIA joint center, Saclay, France
Intern **Fall 2009**
Harvard University, Cambridge, Massachusetts USA
Intern **Summer 2005**
Exalead R&D, Paris, France
Intern **Summer 2004**
University of Paris, 7, Paris, France
Intern **Summer 2003**

Awards & Recognition

Awards	Co-recipient of the 2022 ACM SIGPLAN Programming Languages Software award.
	Co-recipient of the 2021 ACM Software System award.
	Elected Senior member of the ACM, 2017.
	Co-recipient of the 2011 La Recherche award in Information Sciences.
	Co-recipient of the ICST 2024 Best paper award, industry track.
Selective Invitations	Keynote speaker at the first international conference on Probabilistic Programming.
	Invited to the IFIP working group on Functional Programming.
	Invited to the IFIP working group on Programming Languages.
Paper Spotlights	Paper Selected for contributed talk at AABI 2021
	Spotlight paper at ICML 2021
	Spotlight paper at NeurIPS 2014
	Spotlight paper at LearningSys 2016
	Paper selected for journal publication at PPOPP 2016
	Paper selected for journal publication at PPOPP 2017
Other	Speaker at the Oracle Product Architect Community.
	Panelist at the Oracle Product Architect Community.

Grants

Oracle (PI): $50,000 **2021**
Transfer Learning and Invariance for Bayesian Optimization.

Schiller Institute (co-PI): $45,500 **2021**
Hierarchical Gaussian Process Regression for Meta-Learning of Molecular Geometry Optimization.

National Science Foundation (PI): $963,189 **2021**
SHF: Medium: Formally Verified Compilation of Probabilistic Programs.

Oracle (PI): $50,000 **2020**
Formal Semantics and Verified Parsing for an Inference Language.

Service

University Service

Member of the Schiller Search Committee (Boston College, 2021-2022).

Member of the Fitzgerald Search Committee (Boston College, 2021-2022).

Member of Provost's Advisory Council (Boston College, 2021-2022).

Member of the Boston College Cluster Committee (Boston College, 2020-2022).

Academic Service

Steering Committee: POPL workshop on Dafny.

Steering Committee: POPL workshop on Languages for Inference (LAFI).

Organizer: Colloquium on Probabilistic Programming, Collège de France (2022).

Program Chair: POPL'22 workshop on Languages for Inference (LAFI'22).

General Chair: Third International Conference on Probabilistic Programming (ProbProg'21).

Program Chair: POPL'21 workshop on Languages for Inference (LAFI'21).

Program Chair: Second International Conference on Probabilistic Programming (ProbProg'20).

Program Committee: PLDI 2024, CPP 2024, CPP 2023, PLDI 2023, FMCAD 2021, ASPLOS 2021 ERC member, HOPL 4 PC member, PLDI'18 PC member, PPS'18 PC member, IBM PL day 2016 PC member, SNAPL 2017 PC Member, PAPI 2016 PC Member, PPOPP 2016 PC Member, POPL 2012 External Reviewing Committee, Coq Workshop 2012 PC Member.

Referee: ACM Transactions On Parallel Computing, Communication of the ACM, ACM Transations On Programming Languages and Systems, ACM Transaction on Architecture and Code Optimization, Software Practice & Experience, Information Processing Letters, Higher-Order and Symbolic Computation.

Reviewer: AISTATS, SOCC, NeurrIPS, ICML, POPL, PLDI, PPOPP, DISC, PPDP, SSV, CAV.

Other: National Science Foundation panelist in 2013, 2014, 2015. Treasurer for ICFP 2013.

Industry Service

Member of Oracle's patent review committee. (2019-2020).

Participated in M&A tech due diligence at Oracle.

Teaching

Instructor	**Boston College**, Chestnut Hill, Massachusetts USA	
	CSCI 1101.02: Introduction to Computer Science	**Spring 2022**
	Boston College, Chestnut Hill, Massachusetts USA	
	CSCI 1101.03: Introduction to Computer Science	**Spring 2022**
	Boston College, Chestnut Hill, Massachusetts USA	
	CSCI 3340/CHEM 5521: Intro to Machine Learning, Applications to Chemistry	**Fall 2021**
	Boston College, Chestnut Hill, Massachusetts USA	
	CSCI 3383: Algorithms	**Spring 2021**
	Boston College, Chestnul Hill, Massachusetts USA	
	CSCI 3383: Algorithms	**Fall 2020**
	Harvard University, Cambridge, Massachusetts USA	
	CS 281: Advanced Machine Learning	**Fall 2019**
	Harvard University, Cambridge, Massachusetts USA	
	CS 153: Compiler Construction	**Fall 2015**
Independent studies	**Boston College**, Chestnut Hill, Massachusetts USA	
	Independent Study: Quantum Chemistry	**Spring 2022**
	Boston College, Chestnut Hill, Massachusetts USA	
	Independent Study: Applied Natural Language Processing	**Spring 2021**
	Boston College, Chestnut Hill, Massachusetts USA	
	Independent Study: Machine Learning for Chemistry	**Fall 2020**
Teaching Assistant	**Harvard University**, Cambridge, Massachusetts USA	
	Teaching fellow, CS51: Introduction to computer science II	**Spring 2011**
	Harvard University, Cambridge, Massachusetts USA	
	Teaching fellow, CS50: Introduction to computer science I	**Fall 2010**

Student Supervision

Postdocs	Daniel Huang (2020-2021).	Now assistant professor at San Francisco State University.
Research associates	Caleb Miller (2021-2022).	
	Julian Asilis (2021-2022)	Now Ph.D. student at the University Southern California.
Senior Thesis	Jieqi Di (2021-2022). Co-supervised with Kathryn Lindsey, math department. **Scholar of the College**.	
	Ronan Manvelian (2021-2022).	
	Gina Chun (2021-2022).	
	Darius Russell Kish (2020-2021)	Now a Ph.D. student at Harvard University.
	Bryan Ward (2020-2021)	Now a research engineer at the Flatiron institute.
	Emily Walker (2020-2021)	Now at McKinsey & Company.
Internships	Markus de Medeiros (NYU), Fabien Zaiser (Oxford), Anastasiya Kravchuk-Kirilyuk (Harvard), Christopher Brix (Aachen), Shadaj Laddad (Berkeley), Ananya Barthakur (Boston College), Gina Chun (Boston College),Changee Park (KAIST), Joe Tassarotti (Harvard), Daniel Huang (2x) (Harvard), Manzil Zaheer (2x) (CMU), Sam Anzaroot (Umass Amherst), Jay-Yoon Lee (CMU), Koundinya Vajha (U. Pittsburgh), Hao Wu (Northeastern), Chanwei Hu (Duke), Aishwaria Kamath (UMass), Rashika Mishra (Ut Dallas).	

Publications

Thesis & journal publications

Dual-Level Training of Gaussian Processes with Physically Inspired Priors for Geometry Optimizations
Chong Teng, Yang Wang, Daniel Huang, Katherine Martin, Jean-Baptiste Tristan, Lucas Bao
In Journal of Computational and Theoretical Chemistry, 2022.

Dry Reforming of Methane on Doped Ni Nanoparticle: Feature-Assisted Optimizations and Ranking of Doping Metals for Direct Activations of CH4 and CO2
Shiru Lin, Yang Wang, Jean-Baptiste Tristan, Lucas Bao
In Nano Research, 2022.

Geometry Meta-Optimization
Daniel Huang, Lucas Bao, Jean-Baptiste Tristan
In Journal of Chemical Physics, 2022.

mad-GP:Automatic Differentiation of Gaussian Processes for Molecules and Materials
Daniel Huang, Chong Teng, Lucas Bao, Jean-Baptiste Tristan
In Journal of Mathematical Chemistry, 2022.

Using Butterfly-Patterned Partial Sums to Draw from Discrete Distributions
Guy L. Steele Jr., Jean-Baptiste Tristan
In **TOPC'19**: ACM Transaction on Parallel Computing, 2019.

Adding Approximate Counters
Guy L. Steele Jr., Jean-Baptiste Tristan
In **TOPC'17**: ACM Transaction on Parallel Computing, 2017.

Formal Verification of Translation Validators
Jean-Baptiste Tristan
Ph.D. dissertation

Conference Publications

Randomised Testing of the Compiler for a Verification-Aware Programming Language
Alastair F. Donaldson, Dilan Sheth, Jean-Baptiste Tristan, Alex Usher In **ICST 2024**: 17th IEEE International Conference on Software Testing, Verification and Validation. Industry track.

Verified Density Compilation for a Probabilistic Programming Language
Joseph Tassarotti, Jean-Baptiste Tristan
In **PLDI 2023**: 44th ACM SIGPLAN Conference on Programming Language Design and Implementation.

Computable PAC Learning of Continuous Features
Nathanael Ackerman, Julian Asilis, Jieqi Di, Cameron Freer, Jean-Baptiste Tristan
In **LICS'22**: Thirty-Seventh Annual ACM/IEEE Symposium on Logic in Computer Science.

Conjugate Energy-Based Models
Hao Wu, Babak Esmaeili, Michael L Wick, Jean-Baptiste Tristan, Jan-Willem van de Meent
In **ICML'21**: International Conference on Machine Learning, 2021. **Spotlight**

Rate-Regularization and Generalization in Variational Autoencoders
Alican Bozkurt, Babak Esmaeili, Jean-Baptiste Tristan, Dana Brooks, Jennifer Dy, Jan-Willem van de Meent
In **AISTATS'21**: The 24th International Conference on Artificial Intelligence and Statistics, 2021.

A Formal Proof of PAC Learnability for Decision Stumps
Joseph Tassarotti, Koundinya Vajjha, Anindya Banerjee, Jean-Baptiste Tristan
In **CPP'21**: Certified Programs and Proofs, 2021.

Conjugate Energy-Based Models
Hao Wu, Babak Esmaeili, Michael L Wick, Jean-Baptiste Tristan, Jan-Willem van de Meent
In **AABI'21**: 3rd Symposium on Advances in Approximate Bayesian Inference, 2021. **Talk**

Online Post-Processing In Rankings For Fair Utility Maximization
Ananya Gupta, Eric Johnson, Aditya Kumar Roy, Justin Payan, Ari Kobren, Swetasudha Panda, Michael Wick, Jean-Baptiste Tristan.
In **WSDM'21**: The ACM 14th International Conference on Web Search and Data Mining, 2021. **Talk**

Unlocking Fairness: a Trade-off Revisited
Michael L. Wick, Swetasudha Panda, Jean-Baptiste Tristan.
In **NeurIPS'19**: 33rd Conference on Neural Information Processing Systems, 2019.

Scaling Hierarchical Coreference with Homomorphic Compression
Michael L. Wick, Swetasudha Panda, Joseph Tassarotti, Jean-Baptiste Tristan.
In **AKBC'19**: 1st Conference on Automated Knowledge Base Construction, 2019.

Sketching for Latent Dirichlet-Categorical Models
Joseph Tassarotti, Jean-Baptiste Tristan, Michael L. Wick.
In **AISTATS'19**: International Conference on Artificial Intelligence and Statistics, 2019.

Gradient-based Inference for Networks with Output Constraints
Jay-Yoon Lee, Sanket Mehta, Michael L. Wick, Jean-Baptiste Tristan, Jaime Carbonell.
In **AAAI'19**: Thirty-Third AAAI Conference on Artificial Intelligence, 2019.

Flexible Compilation of Probabilistic Programs
Daniel Huang, Jean-Baptiste Tristan, Greg Morrisett.
In **PLDI'17**: ACM SIGPLAN Conference on Programming Language Design and Implementation, 2017.

Using Butterfly-Patterned Partial Sums to Optimize GPU Memory Accesses for Drawing from Discrete Distributions
Guy Steele, Jean-Baptiste Tristan.
In **PPOPP'17**: ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, 2017.

Exponential Stochastic Cellular Automata for Massively Parallel Inference
Manzil Zaheer, Michael Wick, Jean-Baptiste Tristan, Alex Smola, Guy Steele.
In **AISTATS'16**: International Conference on Artificial Intelligence and Statistics, 2016.

Adding approximate counters
Guy Steele, Jean-Baptiste Tristan.
In **PPOPP'16**: ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, 2016.

Efficient Training of LDA on a GPU by Mean-for-Mode Estimation
Jean-Baptiste Tristan, Joseph Tassarotti, Guy Steele.
In **ICML'15**: International Conference on Machine Learning, 2015.

Augur: Data-Parallel Probabilistic Modeling
Jean-Baptiste Tristan, Daniel Huang, Joseph Tassarotti, Adam Pocock, Stephen J. Green, Guy Steele.
In **NIPS'14**: Annual Conference on Neural Information Processing Systems, 2014. **Spotlight**

Parallel programming with big operators
Changhee Park, Guy Steele, Jean-Baptiste Tristan.
In **PPOPP'13**: ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, 2013.

RockSalt: Better, Faster, Stronger SFI for the x86
Greg Morrisett, Gang Tan, Joseph Tassarotti, Jean-Baptiste Tristan, Edward Gan.
In **PLDI '12**: ACM SIGPLAN Conference on Programming Language Design and Implementation, 2012.

Evaluating Value-Graph Translation Validation for LLVM
Jean-Baptiste Tristan, Paul Govereau, Greg Morrisett.
In **PLDI '11**: ACM SIGPLAN Conference on Programming Language Design and Implementation, 2011.

A simple, verified validator for software pipelining
Jean-Baptiste Tristan, Xavier Leroy.
In **POPL '10**: ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages, 2010.

Verified Validation of Lazy Code Motion
Jean-Baptiste Tristan, Xavier Leroy.
In **PLDI '09**: ACM SIGPLAN Conference on Programming Language Design and Implementation, 2009.

Formal verification of translation validators: A case study on instruction scheduling optimizations
Jean-Baptiste Tristan, Xavier Leroy.
In **POPL '08**: ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages, 2008.

Workshop Publications

Generation of Verified Assembly Code Using Dafny and Reinforcement Learning
Christopher Brix, Jean-Baptiste Tristan
In **DAFNY'24**: Dafny workshop

Randomised Testing of the Dafny Compiler
Alastair F. Donaldson, Dilan Sheth, Jean-Baptiste Tristan, Alex Usher
In **DAFNY'24**: Dafny workshop

VMC: a Dafny Library for Verified Monte Carlo Algorithms
Fabian Zaiser, Stefan Zetzsche, Jean-Baptiste Tristan
In **DAFNY'24**: Dafny workshop

Fair Online Post-Processing for Black-Box ML Screening Systems
Swetasudha Panda, Ari Kobren, Jean-Baptiste Tristan, Michael Wick (Oracle Labs)
In **WIML'20**: 15th Women in Machine Learning Workshop.

Using Bayes Factors to Control for Fairness A Case Study on Learning To Rank
Swetasudha Panda, Jean-baptiste Tristan, Haniyeh Mahmoudian, Pallika Kanani, Michael Wick
In **Robust AI in FS'19**: NeurIPS 2019 Workshop on Robust AI in Financial Services: Data,

Fairness, Explainability, Trustworthiness, and Privacy.

Enforcing Output Constraints via SGD: A Step Towards Neural Lagrangian Relaxation
Jay-Yoon Lee, Michael L. Wick, Jean-Baptiste Tristan, Jaime Carbonell
In **AKBC'17**: Workshop on Automated Knowledge Base Construction, 2017.

Sketchy LDA: Towards Streaming Inference
Jean-Baptiste Tristan, Michael L. Wick, Joseph Tassarotti
In **ML Systems'17**: Workshop on ML Systems, 2017.

Comparing Gibbs, EM and SEM for MAP Inference in Mixture Models
Manzil Zaheer, Michael Wick, Satwik Kottur, Jean-Baptiste Tristan.
In **OPT'15**: Optimization for Machine Learning, 2015.

Exponential Stochastic Cellular Automata for Massively Parallel Inference
Manzil Zaheer, Michael Wick, Jean-Baptiste Tristan, Alex Smola, Guy Steele.
In **LearningSys'15**: Workshop on Machine Learning Systems, 2015. **Spotlight**.

Patents

Differentiable set to increase the memory capacity of recurrent neural net works
Jean-Baptiste Tristan, Michael Wick, Manzil Zaheer.

When output units must obey hard constraints
Michael Wick, Jean-Baptiste Tristan, Jay Yoon Lee.

Ensembled decision systems using feature hashing models
Jean-Baptiste Tristan, Adam Pocock, Michael Wick, Guy Steele.

Data-parallel parameter estimation of the Latent Dirichlet allocation model by greedy Gibbs sampling
Jean-Baptiste Tristan, Guy L. Steele Jr.

Systems and Methods for Scalable Hierarchical Coreference
Michael L. Wick, Jean-Baptiste Tristan, Guy L. Steele Jr.

Data-Parallel Probabilistic Inference
Jean-Baptiste Tristan, Guy L. Steele, JR., Daniel E. Huang, Joseph Tassarotti

Learning topics by simulation of a stochastic cellular automaton
Jean-Baptiste Tristan, Stephen J. Green, Guy L. Steele, Jr., Manzil Zaheer

Parallel Gibbs sampler using butterfly-patterned partial sums
Guy L. Steele, Jr., Jean-Baptiste Tristan

Method and system for latent dirichlet allocation computation using approximate counters
Guy L. Steele, Jr., Jean-Baptiste Tristan

Method and system for distributed latent dirichlet allocation computation using addition of approximate counters
Guy L. Steele, Jr., Jean-Baptiste Tristan

Sparse and data-parallel inference method and system for the latent Dirichlet allocation model
Jean-Baptiste Tristan, Joseph Tassarotti, Guy L. Steele Jr.