

JEAN-GABRIEL YOUNG

Assistant Professor

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RESEARCH INTERESTS: Statistical Inference, Epidemiology, Complex Networks, Complex Systems

ACADEMIC POSITIONS

- *University of Vermont*, Assistant Professor, [Department of Mathematics and Statistics](#)^{*} 2021–
- *Université Laval*, Professeur Associé [Département de Physique](#) 2020–
- *University of Vermont*, Research Assistant Professor, [Department of Computer Science](#) 2020–2021
- *University of Michigan*, Postdoctoral Fellow, [Center for the Study of Complex Systems](#) 2018–2020
- *Université Laval*, Research Assistant, [Group of Prof. Louis. J. Dubé](#) 2012–2018

EDUCATION

- Ph.D. in Physics*, *Université Laval* 2014–2018
- *Thesis title*: Inférence et réseaux complexes [†]
 - *Advisors*: Louis J. Dubé and Patrick Desrosiers
- M.Sc. in Physics*, *Université Laval* 2012–2014
- *Thesis title*: De la détection de la structure communautaire des réseaux complexes [‡]
 - *Advisors*: Louis J. Dubé
- B.Sc. in Physics*, Theoretical Physics major, *Université Laval* 2009–2012

SCHOLARSHIPS, GRANTS AND AWARDS

Fellowships and Scholarships

- *Postdoctoral Fellowship in Studying Complex Systems*, [James S. MacDonnell Foundation \(\\$200 000\)](#) 2017
- *Doctoral Research Scholarship*, [Fonds de recherche du Québec – Nature et Technologies \(\\$60 000\)](#) 2014

Grants

- *OVPR Express Grant*, [University of Vermont \(\\$3000, PI\)](#) 2021
- *YRNCS Bridge Grant*, [Young Researcher Network On Complex Systems \(€1000, PI\)](#) 2016

Awards

- *FOSS Award*, 2021 Mining Software Repositories Conference 2021
- *Zachary Karate Club Club* award 2021
- *Best oral presentation award*, [NERCCS 2020](#) 2020
- *Board of Honour* (Highest overall mark award by all committee members), Ph.D thesis, *Université Laval* 2018
- *Concours d'expression scientifique Pierre Amiot*, [Physics Department, Université Laval](#) 2016

^{*}Secondary appointment with: Vermont Complex Systems Center, Larner College of Medicine, Department of Computer Science

[†]Inference and complex networks

[‡]Of community structure detection on complex networks

PUBLICATIONS

Peer-reviewed journals (27)

27. [Spatial epidemiology and adaptive targeted sampling to manage the Chagas disease vector *Triatoma dimidiata*](#) 2022
B. K. M. Case, **J.-G. Young**, D. Penados, L. Hébert-Dufresne, and L. Stevens
PLOS Negl. Trop. Dis. 16, e0010436
26. [Impact and dynamics of hate and counter speech online](#) 2022
J. Garland, K. Ghazi-Zahedi, **J.-G. Young**, L. Hébert-Dufresne and M. Galesic
EPJ Data Sci. 11, 3
25. [Clustering of heterogeneous populations of networks](#) 2022
J.-G. Young, A. Kirkley and M. E. J. Newman
Phys. Rev. E 105, 014312
24. [Reconstruction of plant–pollinator networks from observational data](#) 2021
J.-G. Young, F. S. Valdovinos and M. E. J. Newman
Nat. Commun. 12, 3911
23. [Hypergraph reconstruction from network data[§]](#) 2021
J.-G. Young, G. Petri and T. P. Peixoto
Commun. Phys. 4, 135
22. [A clarified typology of core-periphery structure in networks](#) 2021
R. J. Gallagher, **J.-G. Young** and B. Foucault Welles
Sci. Adv. 7, eabc9800
21. [Bayesian inference of network structure from unreliable data](#) 2021
J.-G. Young, G. T. Cantwell and M. E. J. Newman
J. Complex. Netw. 8, cnaa046
20. [Inference, model selection, and the combinatorics for growing trees](#) 2021
G. T. Cantwell, G. St-Onge and **J.-G. Young**
Phys. Rev. Lett. 126, 038301
19. [Networks beyond pairwise interactions: structure and dynamics \(review\)](#) 2020
F. Battiston, G. Cencetti, I. Iacopini, V. Latora, M. Lucas, A. Patania, **J.-G. Young** and G. Petri
Phys. Rep. 874
18. [Improved mutual information measure for classification and community detection](#) 2020
M. E. J. Newman, G. T. Cantwell and **J.-G. Young**
Phys. Rev. E 101, 042304
17. [Macroscopic patterns of interacting contagions are indistinguishable from social reinforcement](#) 2020
L. Hébert-Dufresne, S. V. Scarpino and **J.-G. Young**
Nat. Phys. 16, 426
16. [Phase transition in the recoverability of network history](#) 2019
J.-G. Young, G. St-Onge, E. Laurence, C. Murphy, L. Hébert-Dufresne and P. Desrosiers
Phys. Rev. X 9, 041056
15. [Efficient sampling of spreading processes on complex networks using a composition and rejection algorithm](#) 2019
G. St-Onge, **J.-G. Young**, L. Hébert-Dufresne and L. J. Dubé
Comput. Phys. Commun. 240, 30
14. [Universality of the stochastic block model](#) 2018
J.-G. Young, G. St-Onge, P. Desrosiers and L.J.Dubé
Phys. Rev. E 98, 032309
13. [Exact analytical solution of irreversible binary dynamics on networks](#) 2018
E. Laurence, **J.-G. Young**, S. Melnik and L.J.Dubé
Phys. Rev. E 97, 032302

[§]Appears in the Focus Collection on Higher-order Interaction Networks

12. [Phase transition of the susceptible-infected-susceptible dynamics on time-varying configuration model networks](#) 2018
G. St-Onge, **J.-G. Young**, E. Laurence, C. Murphy and L. J. Dubé
Phys. Rev. E 97, 022305
11. [Construction of and efficient sampling from the simplicial configuration model](#) 2017
J.-G. Young, G. Petri, F. Vaccarino and A. Patania
Phys. Rev. E 96, 032312
10. [Strategic tradeoffs in competitor dynamics on adaptive networks](#) 2017
L. Hébert-Dufresne, A. Allard, P.-A. Noël, **J.-G. Young**, and E. Libby
Sci. Rep. 7, 7576
9. [Finite size analysis of the detectability limit of the stochastic block model](#) 2017
J.-G. Young, P. Desrosiers, L. Hébert-Dufresne, E. Laurence and L. J. Dubé
Phys. Rev. E 95, 062304
8. [Growing networks of overlapping communities with internal structure](#) 2016
J.-G. Young, L. Hébert-Dufresne, A. Allard and L. J. Dubé
Phys. Rev. E 94, 022317
7. [Constrained growth of complex scale-independent systems](#) [¶] 2016
L. Hébert-Dufresne, A. Allard, **J.-G. Young** and L. J. Dubé
Phys. Rev. E 93, 032304
6. [Complex networks as an emerging property of hierarchical preferential attachment](#) 2015
L. Hébert-Dufresne, E. Laurence, A. Allard, **J.-G. Young** and L. J. Dubé
Phys. Rev. E 92, 062809
5. [General and exact approach to percolation on random graphs](#) 2015
A. Allard, L. Hébert-Dufresne, **J.-G. Young** and L. J. Dubé
Phys. Rev. E 92, 062807
4. [A shadowing problem in the detection of overlapping communities](#) 2015
J.-G. Young, A. Allard, L. Hébert-Dufresne and L. J. Dubé
PLOS ONE 10, e0140133
3. [Coexistence of phases and the observability of random graphs](#) [¶] 2014
A. Allard, L. Hébert-Dufresne, **J.-G. Young** and L. J. Dubé
Phys. Rev. E 89, 022801
2. [Percolation on random networks with arbitrary \$k\$ -core structure](#) 2013
L. Hébert-Dufresne, A. Allard, **J.-G. Young** and L. J. Dubé
Phys. Rev. E 88, 062820
1. [Global efficiency of local immunization on complex networks](#) 2013
L. Hébert-Dufresne, A. Allard, **J.-G. Young** and L. J. Dubé
Sci. Rep. 3, 2171

Peer-reviewed conference proceeding (5)

5. [Cutting through the noise to infer autonomous system topology](#) 2022
K. G. Leyba, J. J. Daymude, **J.-G. Young**, M. E. J. Newman, J. Rexford and S. Forrest
INFOCOM 2022, Proceedings of the 2022 IEEE International Conference on Computer Communications, pp. 1609–1618.
4. [The OCEAN mailing list data set: Network analysis spanning mailing lists and code repositories](#) 2022
M. Warrick, S. F. Rosenblatt, **J.-G. Young**, L. Hébert-Dufresne and J. P. Bagrow
MSR 2022, Proceedings of the 19th International Conference on Mining Software Repositories
3. [Which contributions count? Analysis of attribution in open source](#) 2021
J.-G. Young, A. Casari, K. McLaughlin, M. Z. Trujillo, L. Hébert-Dufresne and J. P. Bagrow
MSR 2021, Proceedings of the 18th International Conference on Mining Software Repositories
2. [Countering hate on social media: Large scale classification of hate and counter speech](#) 2020
J. Garland, K. Ghazi-Zahedi, **J.-G. Young**, L. Hébert-Dufresne and M. Galesic
ACL 2020, Proceedings of the Fourth Workshop on Online Abuse and Harms, pp. 102–112.

[¶]Editors' suggestion

1. [Connected graphs with a given degree sequence: Efficient sampling, correlations, community detection and robustness](#) 2020
J. Ring IV, **J.-G. Young** and L. Hébert-Dufresne.
NetSci-X 2020, Proceedings of NetSci-X 2020: Sixth International Winter School and Conference on Network Science, pp. 33–47.

Other edited works (2)

2. [Book review: Advances in Network Clustering and Blockmodeling](#) 2022
J.-G. Young
J. Soc. Struct. 23, 47
1. [Open source ecosystems need equitable credit across contributions](#) 2021
A. Casari, K. McLaughlin, M. Z. Trujillo, **J.-G. Young**, J. P. Bagrow and L. Hébert-Dufresne
Nat. Comput. Sci. 1, 2

Preprints in submission (6)

- [Opposing responses to scarcity emerge from functionally unique sociality drivers](#)
A. B. Kao, A. K. Hund, F. P. Santos, **J.-G. Young**, D. Bhat, J. Garland, R. A. Oomen and H. F. McCreery
Based on: bioRxiv:2020/994343
Under review, *Am. Nat.*
- [The network epidemiology of an Ebola epidemic](#)
L. Hébert-Dufresne, **J.-G. Young**, J. Bedson, L. Skrip, D. Pedi, M. F. Jalloh, B. Raulier, O. Lapointe-Gagné, A. Jambai, A. Allard and B. Althouse
arXiv:2111.08686
Under review, *Nature*
- [Latent network models to account for noisy, multiply-reported social network data](#)
C. De Bacco, M. Contisciani, J. Cardoso-Silva, H. Safdari, D. Theuerkauf, T. Sweet, **J.-G. Young**, J. Koster, C. Ross, R. McElreath, D. Redhead, E. A. Power
arXiv:2112.11396
Under review, *J. R. Stat. Soc. A*
- [The promise of trans-species coexpression analysis in studying the coevolution and ecology of host-parasite interactions.](#)
A. Hund, P. Tiffin, **J.-G. Young**, and D. Bolnick
arXiv:2206.12711
Submitted, *Evolution*
- [Hypergraph reconstruction from noisy data](#)
S. Lizotte, **J.-G. Young**, and A. Allard
arXiv:2208.06503
Submitted, *Communication Physics*.
- [Network Onion Divergence: Network representation and comparison using nested configuration models with fixed connectivity, correlation and centrality pattern](#)
L. Hébert-Dufresne, **J.-G. Young**, A. Daniels and A. Allard
arXiv:2204.08444

TEACHING AND MENTORING

Instructor

- STAT-330: *Bayesian Statistics* F2021, F2022
- STAT-395: *Statistical Network Analysis* S2021

Schools and guest lectures

- [CSYS/CS 302: Modeling Complex Systems](#), University of Vermont, Burlington VT , 2020, 2021
- [CNWW2020: Complex Networks Winter Workshop](#), Québec, Canada 2020
- [CRM Summer School: Spectral Theory and Applications](#), Québec, Canada 2016

Supervision

- Postdoctoral fellows:
 - ◊ Nicholas W. Landry, University of Vermont 2022–
- Ph.D. students:
 - ◊ Simon Lizotte, Université Laval (co-direction with Antoine Allard) 2022–
 - ◊ A. Daniels, University of Vermont 2022–
 - ◊ Jonathan St-Onge, University of Vermont 2022–
 - ◊ Nicholas J. Robert, University of Vermont 2021–
 - ◊ B. K. M. Case, University of Vermont 2021–
- Master's students:
 - ◊ Erik Weis, University of Vermont 2021–
 - ◊ Frederick Hall, University of Vermont 2021–
 - ◊ Simon Lizotte, Université Laval (co-direction with Antoine Allard) 2020–2022
- Undergraduate students:
 - ◊ Trevor Blanchard (Honors Thesis), University of Vermont AY 22/23

INVITED TALKS AND SELECTED CONFERENCE CONTRIBUTIONS

- *"Uncertain Network Science"* 2021–2022
 - ▷ Channing Network Science Seminar, Boston MA, USA (invited seminar)
 - ▷ NERCCS 2022 conference, Buffalo, NY, USA (invited plenary)
 - ▷ University of Vermont — Seminar in Mechanical Engineering, Burlington VT, USA (invited seminar)
 - ▷ Central European University, Department of Network and Data Science (invited seminar)
- *"Which contributions count? Analysis of attribution in open source"* 2021
 - MSR2021, online (talk)
- *"Inference with growing networks"* 2021
 - CNWW2020, online (invited talk)
- *"Bayesian approaches to network epidemiology"* 2020
 - HONS 2020, online (invited talk)
- *"Paper Unwind: Network archaeology"* 2020
 - School of the NERCCS 2020 conference, Buffalo, NY, USA (invited talk)
- *"Efficient and fully bayesian inference of complex networks from noisy data"* 2019–2020
 - ▷ Indiana University — CNETS, Bloomington, IN, USA (invited seminar)
 - ▷ Université Laval — CIMMUL, Québec, QC, Canada (invited seminar)
 - ▷ Netsci-X 2020, Tokyo, Japan (talk)
 - ▷ NERCCS 2020, Buffalo, NY, USA (talk, best presentation award)
 - ▷ University of Michigan — Jacobs Lab (UMSI), Ann Arbor MI, USA (invited seminar)
 - ▷ Indiana University — Betzel Lab, Bloomington, IN, USA (invited seminar)
 - ▷ Netsci 2020, online (talk)
- *"Compression of treelike complex networks using layered configuration models"* 2019
 - Netsci 2019, Burlington, VT, USA (talk)
- *"Bayesian inference of effective contagion models from population level data"* 2019
 - SINM 2019, Burlington, VT, USA (talk)
- *"Universality of the stochastic block model"* 2019
 - SYNS Warm-up Event 2019, Burlington, VT, USA (invited talk)
- *"The statistical physics of inference for Complex Networks"* 2018
 - Department of Physics Colloquium Oakland University, Rochester, MI, USA (invited seminar)
- *"Network archaeology: phase transition in the recoverability of network history"* 2018
 - ▷ Univeristy of Colorado Boulder — StatOptML seminar, Boulder, CO, USA (invited seminar)
 - ▷ Univeristy of Vermont — Vermont Complex Systems Center, Burlington, VT, USA (invited seminar)
 - ▷ Netsci 2018, Paris, France (talk)
 - ▷ Sentinel North 2018 Annual Meeting, Québec, Canada (plenary)
 - ▷ Univeristy of Bath — Centre for Networks and Collective Behaviour, Bath, UK (invited seminar)

- ▷ [Connected Past 2018](#), Oxford, UK (talk)
- *“Construction of and efficient sampling from the simplicial configuration model”* 2017
 - ▷ [HONS 2017](#), Indianapolis, IN, USA (invited talk)
 - ▷ [Indiana University — School of Informatics](#), Bloomington, IN, USA (invited seminar)
 - ▷ [University of Michigan — Center for the Study of Complex Systems](#), Ann Arbor, MI, USA (invited talk)
- *“Statistical mechanics of mesoscopic structure extraction”* 2017
 - [Netsci 2017](#), Indianapolis, IN, USA (talk)
- *“Finite size analysis of the detectability limit of the stochastic block model”* 2016
 - ▷ [Netsci 2016](#), Seoul, Korea (lightning talk)
 - ▷ [SINM 2016](#), Seoul, Korea (talk)
 - ▷ [ISI Foundation](#), Torino, Italy (invited seminar)
- *“Structural preferential attachment: scale-free benchmark for overlapping community detection algorithms”* 2015
 - [Netsci 2015](#), Zaragoza, Spain (poster)
- *“Structural preferential attachment of community structure and its relation to Dunbar’s number”* 2014
 - [Netsci 2014](#), Berkeley, CA, USA (talk)
- *“Complex networks are an emerging property of hierarchical preferential attachment”^{II}* 2014
 - [NetSci 2014 Science](#), Berkeley, CA, USA (poster)
- *“Local and global solutions to community detection: when resolution matters”* 2013
 - [NetSci 2013](#), Copenhagen, Denmark (poster)

LEADERSHIP AND SERVICE

Organizer

- *Satellite location organizer (UVM)*, [NERCCS 2022](#) 2022
- *Organizer*, [SINM \(Statistical Inference for Network Models\)](#) 2021, 2022
- *Organizer*, [SIAM DS 21 Mini-Symposium on Dynamics in Higher-Order Networks](#), online 2021
- *Co-director*, [CNWW2021](#), Complex Networks Winter Workshop, Québec, Canada 2021
- *Program co-chair*, First [OpenNetSci Hackathon](#), Burlington VT, USA 2019
- *Adjacent Activities Committee*, [NetSci 2019](#), Burlington VT, USA 2019

Service

- *AUR Maintainer*, Several python packages ongoing
- *Contributor*, Several open-source projects ongoing
- *Seminar chair*, [STAT@UVM](#) 2022–
- *Seminar chair*, [Vermont Complex Systems Center](#) 2021–
- *Board member*, Student Investment Fund, Université Laval 2013–2016
- *Technical Director*, [Coupe de Science \(Science Cup\)](#), Université Laval 2011–2014
- *Technical Director*, [Festival de Sciences et Génies \(Science and Engineering Festival\)](#) 2010–2012

Reviewer

- *Grants*: Panelist, NSF, IIS Division (2019).
- *Journals (27)*: [Science Advances](#), [SIAM Review](#), [Physical Review Letters](#), [Physical Review X](#), [Psychological Methods](#), [PLOS Computational Biology](#), [Physical Review E](#), [Physical Review Research](#), [EPJ Data Science](#), [Scientific Data](#), [Cambridge Elements](#), [EPL](#), [Journal of Open Source Software](#), [Journal of Physics: Complexity](#), [Journal of Physics A](#), [Scientific Reports](#), [Palgrave Communications](#), [PLOS ONE](#), [Journal of Complex Networks](#), [Physics Letter A](#), [Chaos Solitons & Fractals](#), [Entropy](#), [Network Science](#), [Animal Behaviour](#), [Applied Network Science](#), [Journal of Computational Science](#), [Chaos](#).

Program committee

- [Northeast Regional Conference on Complex Systems \(NERCCS\)](#) 2020, 2021, 2022

^{II} Outstanding poster award

- International School and Conference on Network Science (NetSci) 2019, 2020
- SIAM Workshop on Network Science (SIAM NS) 2018, 2020

SELECTED SOFTWARE

(Complete list available online)

- Bayesian inference of networks from noisy data (stan)
- Bayesian inference of effective contagion models from population level data (stan)
- Reconstruction of plant–pollinator networks from observational data (stan + python)
- Sequential MC sampler for Network Archaeology (python + C++)
- MCMC sampler for the Simplicial Configuration Model (C++)
- MCMC sampler for the Stochastic Block Model (C++)
- Structural Preferential Attachment community detection benchmark (C++)

VARIA

Selected media coverage

- “A selection of 2020’s highlighted research.” Nature 2021
- “To find the right network model, compare all possible histories.” Phys.org 2021
- “Fighting Hate Speech with AI & Social Science,” Complexity Podcast 2020
- “How you talk about coronavirus actually impacts its spread,” cnet 2020
- “Neue Studie zeigt Wirksamkeit von Gegenrede im Netz,” netzpolitik.org 2020
- “When coronavirus is not alone,” Phys.org 2020
- “The shape of randomness.” Physics Central 2017
- “What algae can tell us about political strategy.” Phys.org 2017
- “L’univers complexe de Jean-Gabriel Young.” Le Soleil (French) 2017