

Naneh Apkarian, PhD

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CURRENT POSITION

Assistant Professor of Mathematics Education
School of Mathematical and Statistical Sciences
Arizona State University
Tempe, AZ, USA

EDUCATION

PhD | Mathematics Education | 2013 - 2018

University of California San Diego & San Diego State University
Dissertation: *Transforming Precalculus to Calculus 2: A Longitudinal Study of Social and Structural Change in a University Mathematics Department*
Advisor: Dr. Chris Rasmussen, San Diego State University

MA | Mathematics | 2011 – 2013

University of California San Diego
Qualifying exams: Applied Algebra; Complex Analysis

BA | Mathematics | 2006 – 2010

Pomona College
Thesis: *Cutsets on Boolean Lattices*
Advisor: Dr. Shahriar Shahriari

RESEARCH EXPERIENCE

Major involvement

Evaluating the Uptake of Research-Based Instructional Strategies in Undergraduate Chemistry, Mathematics, & Physics

NSF DUE #1726328, #1726281, #1726042, #1726126, #2028134 |

sites.google.com/view/rbisproject/home

Postdoctoral Research Associate (2018-current)

- Project aimed to increase our understanding of the reasons why instructors of introductory mathematics, chemistry, and physics courses choose to use research-based instructional strategies or choose not to.
- Development of a survey about instructional practices, individual characteristics, and contextual features that was then sent to 17,000 instructors across the country at (associate's colleges, baccalaureate colleges, master's colleges, and doctoral universities).
- Survey analysis and dissemination of results; development of interview protocols as a follow-up targeting the influence of leadership and organizational factors in instructors' decisions related to instructional practice.

Progress through Calculus (PtC)

NSF DUE #1430540 | www.maa.org/ptc

Senior Personnel (2018-current), Research Assistant (2015-18)

- Design, distribution, and analysis of a national census survey of university mathematics departments about their Precalculus through Calculus 2 courses and programs
- Participation in case studies of 12 sites, including: development of interview protocols; individual and group interviews; development and distribution of surveys for instructors and students.
- Ongoing qualitative and quantitative analyses of case study data.
- Co-lead of sub-team investigating narratives of change at five participating sites, including managing graduate student research associates

Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL)

NSF DUE #1624610, #1624643, #1624628, #1624639, 2016-2021 | www.aplu.org/seminal

Senior Personnel (2020-21), Research Assistant (2015-20)

- Co-leading Phase 3, a supplemental phase of SEMINAL which is investigating change efforts at sites which applied for, but did not receive, funding and advising from the grant in 2017.
- Collaborative development of surveys and interview protocols, working with PtC and SEMINAL personnel to create coherent instrumentation suites for both phases of the SEMINAL project
- Analysis of Phase 1 data, with a particular focus on the role of course coordination in the change process and current function of six department which have implemented active learning already
- Informal consultation about the structure of Phase 2 of SEMINAL, including lessons learned through dissertation work

Knowledge Shifts in the Mathematics Classroom: The Roles of Students and Teachers

Israeli Science Foundation, Grants No. 438/15, 2015-2019

Research Assistant

- Collection of classroom video data in a masters-level course centered on the mathematics of chaos, fractals, and dynamical systems; design and conduction of individual semi-structured problem-solving interviews with students
- Qualitative analysis of classroom and interview data using different theoretically grounded methodologies and subsequent integration of both theory and results

Exploring the Role of Instructors' Social Networks in Undergraduate STEM Instructional Improvement

NSF DUE #1550990

Research Assistant

- Designing, planning, and running of a two-workshop series intended to accelerate knowledge development about the use of social network analysis in studying undergraduate instruction
- Co-editor and chapter co-author of resulting book about the usage of social network analysis to accelerate change at the undergraduate department level

Minor involvement

Teaching Inquiry-oriented Mathematics: Establishing Supports (TIMES)

NSF DUE #1431595, #143141, #1431393 | times.math.vt.edu

Research Assistant

- Classroom data collection in an undergraduate inquiry-oriented differential equations course
- Qualitative analysis of classroom data

Characteristics of Successful Programs in College Calculus (CSPCC)

NSF DRL #0910240 | www.maa.org/cspcc

Research Assistant

- Design and execution of social network-oriented follow-up study of selected institutions from sites that participated in the initial CSPCC project

Research Experience for Undergraduates and Teachers 2009: Biomathematics Project

San Diego State University

Undergraduate Research Assistant

- Comparison of multiple vector space methods and discrimination models for the analysis of the metabolic activity of microbial systems through metagenomes

TEACHING EXPERIENCE

Arizona State University

Mathematics

- MAT 207: Algebra and Geometry in the High School (FA20)
- MAT 170: Precalculus (SP21)

Mathematics Education

- MTE 210: Mentored Tutoring Internship (FA20)
- MTE 591: Topic: Math Education Seminar (SP21)

Prior teaching roles

Instructor, Department of Mathematics & Statistics, San Diego State University, 2013 – 2014
Elementary Number Systems (Math 210)

Research Observer / Co-instructor, Department of Mathematics & Statistics, San Diego State University

Differential Equations. Primary Instructor: Dr. Chris Rasmussen (FA16)

Dynamical Systems. Primary Instructor: Dr. Tommy Dreyfus (FA14)

Teaching Assistant, Department of Mathematics, University of California, San Diego, 2012 – 2013

Cryptography (Math 187)

Geometric Computer Graphics (Math 155A)

Linear Algebra (Math 20F)

Differential Equations (Math 20D)

PUBLICATIONS

Journal articles

Apkarian, N., & Rasmussen, C. (2020). Instructional leadership structures across five university departments. *Higher Education*. <https://doi.org/10.1007/s10734-020-00583-6>. Available at <https://rdcu.be/b5qY3>

Pilgrim, M. E., **Apkarian, N.**, Milbourne, H., & O'Sullivan, M. (2020). From rough waters to calm seas: The challenges and successes of building a GTA PD program. *PRIMUS*. <https://doi.org/10.1080/10511970.2020.1793851>

- Goodchild, S., **Apkarian, N.**, Rasmussen, C., & Katz, B. (2020). Engaging a critical stance within a community of inquiry. *Journal of Mathematics Teacher Education*, 1-22.
<https://doi.org/10.1007/s10857-020-09456-2>. Available at <https://rdcu.be/b22nd>
- Tabach, M., Rasmussen, C., Dreyfus, T., & **Apkarian, N.** (2020). Towards an argumentative grammar for networking: A case of coordinating two approaches. *Educational Studies in Mathematics*, 103(2), 139-155. <https://doi.org/10.1007/s10649-020-09934-7>. Available at <https://rdcu.be/b1g44>
- Rasmussen, C., **Apkarian, N.**, Tabach, M., & Dreyfus, T. (2020). Ways in which engaging in someone else's reasoning is productive. *Journal of Mathematical Behavior*, 58, 100742.
- Reinholz, D. L., Matz, R. M., Cole, R., & **Apkarian, N.**, (2019). STEM is not a monolith: A preliminary analysis of variations in STEM disciplinary cultures and implications for change. *CBE—Life Sciences Education*, 18(4). <https://doi.org/10.1187/cbe.19-02-0038>
- Voigt, M., **Apkarian, N.**, Rasmussen, C., & Progress through Calculus Team. (2019). Undergraduate course variations in Precalculus through Calculus 2. *International Journal of Mathematical Education in Science and Technology*. <https://doi.org/10.1080/0020739X.2019.1636148>
- Apkarian, N.**, Kirin, D., Gehrtz, J., & Vroom, K. (2019). Connecting the stakeholders: Departments, policy, and research in undergraduate mathematics education. *PRIMUS*.
<https://doi.org/10.1080/10511970.2019.1629135>
- Apkarian, N.**, Tabach, M., Dreyfus, T., & Rasmussen, C. (2019). The Sierpinski smoothie: Blending area and perimeter. *Educational Studies in Mathematics*, 101(1), 19-34.
<https://doi.org/10.1007/s10649-019-09889-4>. Available at <https://rdcu.be/bqXod>
- Reinholz, D. L., Bradfield, K., & **Apkarian, N.** (2019). Using analytics to support instructor reflection on student participation in a discourse-focused undergraduate mathematics classroom. *International Journal of Research in Undergraduate Mathematics Education*, 5(1), 56-74.
<https://doi.org/10.1007/s40753-019-00084-7>
- Rasmussen, C., **Apkarian, N.**, Hagman, J. E., Johnson, E., Larsen, S., Bressoud, D., & Progress through Calculus team. (2019). Characteristics of Precalculus through Calculus 2 programs: Insights from a national census survey. *Journal of Research in Mathematics Education*, 50(1), 98-112.
<https://doi.org/10.5951/jresmetheduc.50.1.0098>
- Apkarian, N.**, Bowers, J., O'Sullivan, M. E., & Rasmussen, C. (2018). A case study of change in the teaching and learning of Precalculus to Calculus 2: What we're doing with what we have. *PRIMUS*, 28(6), 528-549. <https://doi.org/10.1080/10511970.2017.1388319>
- Reinholz, D. L., & **Apkarian, N.** (2018). Four frames for systemic change in STEM departments. *International Journal of STEM Education*, 5(3), 1-10. <https://doi.org/10.1186/s40594-018-0103-x>
- Dinsdale, E.A., Edwards, R.A., Bailey, B.A., Tuba, I., Akhter, S., McNair, K., Schmieder R., **Apkarian, N.**, Creek, M., Guan, E., Hernandez, M., Isaacs, K., Peterson, C., Regh, T., & Ponomarenko, V. (2013) Multivariate analysis of functional metagenomes. *Frontiers: Genetics*, 4(41).
<https://doi.org/10.3389/fgene.2013.00041>

Manuscripts under review

- Apkarian, N.**, Henderson, C., Stains, M., Raker, J. R., Johnson, E., & Dancy, M. H. (in review). What really impacts the use of active learning in undergraduate STEM education? [Submitted FA20]
- Yik, B. J., Raker, J. R., **Apkarian, N.**, Stains, M., Henderson, C., Dancy, M. H., & Johnson, E. (in review). Evaluating the impact of malleable factors on percent time lecturing in gateway chemistry, mathematics, and physics courses. [Submitted FA20]
- Vroom, K., Gehrtz, J., **Apkarian, N.**, Alzaga Elizondo, T., Ellis, B., & Hagman, J. E. (in revision). First-year mathematics students' perceptions of ambitious teaching. [Submitted SP20]

Refereed conference proceedings

- Apkarian, N.**, Johnson, E., Raker, J. R., Stains, M., Henderson, C., Dancy, M. H. (2020). Assessing the Uptake of Research Based Instructional Strategies by Postsecondary Mathematics Instructors. In S. S. Karunakaran, Z. Reed., & A. Higgins (Eds.), *Proceedings of the 23rd Annual Conference on Research in Undergraduate Mathematics Education*, 18-27. Boston, MA.
- Alzaga Elizondo, T., Ellis, B., **Apkarian, N.**, Sánchez Robayo, B., Robbins, C. K., & Johnson, E. (accepted 2020). Departmental change in reaction to the threat of losing calculus: Three cases. In S. S. Karunakaran, Z. Reed., & A. Higgins (Eds.), *Proceedings of the 23rd Annual Conference on Research in Undergraduate Mathematics Education*, 151-158. Boston, MA.
- Williams, M., **Apkarian, N.**, Uhing, K., Funk, R., Smith, W. M., Wakefield, N., Martinez, A., & Rasmussen, C. (accepted 2020). In the driver's seat: Course coordinators as change agents for active learning in university Precalculus to Calculus 2. In S. S. Karunakaran, Z. Reed., & A. Higgins (Eds.), *Proceedings of the 23rd Annual Conference on Research in Undergraduate Mathematics Education*, 637-645. Boston, MA.
- Apkarian, N.**, & Reinholz, D. L. (2019). Understanding and enacting organizational change: An approach in four frames. In A. Weinberg, D. Moore-Russo, H. Soto, & M. Wawro (Eds.), *Proceedings of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*, pp. 10-17. Oklahoma City, OK.
- Vroom, K., Gehrtz, J., Alzaga Elizondo, T., Ellis, B., **Apkarian, N.**, & Hagman, J. E. (2019). First-year mathematics students' view of helpful teaching practices. In A. Weinberg, D. Moore-Russo, H. Soto, & M. Wawro (Eds.), *Proceedings of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*, pp. 1055-1060. Oklahoma City, OK.
- Apkarian, N.**, Kirin, D., & Voigt, M. (2019). Course coordination patterns in university precalculus and calculus courses. In A. Weinberg, D. Moore-Russo, H. Soto, & M. Wawro (Eds.), *Proceedings of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*, pp. 834-839. Oklahoma City, OK.
- Apkarian, N.**, Rasmussen, C., Tabach, M., & Dreyfus, T. (2018). Conceptual blending: The case of the Sierpinski Triangle area and perimeter. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 21st Annual Conference on Research in Undergraduate Mathematics Education*, 169-184 (long paper); 541-548 (short paper). San Diego, CA.
- Apkarian, N.** (2018). Emerging instructional leadership in a new course coordinator system. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 21st Annual Conference on Research in Undergraduate Mathematics Education*, 1414-1419. San Diego, CA.
- Dreyfus, T., Rasmussen, C., **Apkarian, N.**, & Tabach, M. The complexity of knowledge construction in a classroom setting. *INDRUM 2018: INDRUM Network*, University of Agder, Kristiansand, Norway. [hal-01849971](https://hal.archives-ouvertes.fr/hal-01849971)
- Apkarian, N.**, Rasmussen, C. (2017). Mathematics instruction leadership in undergraduate departments. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education*, 485-493. San Diego, CA.
- Quardokus Fisher, K., **Apkarian, N.**, & Walter, E. (2017). Let's talk about teaching: Investigating instructors' social networks. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education*, 1214-1218. San Diego, CA.
- Voigt, M., Rasmussen, C., & **Apkarian, N.** (2017). Variations in Precalculus through Calculus 2 courses. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 20th*

Annual Conference on Research in Undergraduate Mathematics Education, 1001-1008. San Diego, CA.

Kirin, D., Vroom, K., Larsen, S., & **Apkarian, N.** (2017). Instruction in precalculus and single-variable calculus in the United States: A bird's eye view. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) *Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education*, 1267-1272. San Diego, CA.

Rasmussen, C., **Apkarian, N.**, Dreyfus, T., & Voigt, M. (2016). Ways in which engaging in someone else's reasoning is productive. In E. Nardi, C. Winsløw, & T. Hausberger (Eds.), *Proceedings from INDRUM 2016: First conference of the International Network for Didactic Research in University Mathematics*, 504-513. University of Montpellier & INDRUM: Montpellier, France.

Apkarian, N. (2016). Talking about teaching: Social networks of instructors of undergraduate mathematics. In T. Fukawa-Connelly, N. Infante, M. Wawro, & S. Brown (Eds.), *Proceedings of the 19th Annual Conference on Research in Undergraduate Mathematics Education*, 515-518. Pittsburgh, PA.

Apkarian, N., Rasmussen, C., Dreyfus, T., Voigt, M., Milbourne, H., & Gao, X. (2016). Ways in which engaging in someone else's reasoning is productive. In T. Fukawa-Connelly, N. Infante, M. Wawro, & S. Brown (Eds.), *Proceedings of the 19th Annual Conference on Research in Undergraduate Mathematics Education*, 518-526. Pittsburgh, PA.

Apkarian, N., & Kirin, D. (2016). Active learning in undergraduate precalculus and single variable calculus. In T. Fukawa-Connelly, N. Infante, M. Wawro, & S. Brown (Eds.), *Proceedings of the 19th Annual Conference on Research in Undergraduate Mathematics Education*, 512-514. Pittsburgh, PA.

Rasmussen, C., **Apkarian, N.**, Bressoud, D., Ellis, J., Johnson, E., & Larsen, S. (2016). A national investigation of precalculus through calculus 2. In T. Fukawa-Connelly, N. Infante, M. Wawro, & S. Brown (Eds.), *Proceedings of the 19th Annual Conference on Research in Undergraduate Mathematics Education*, 1245-1251. Pittsburgh, PA.

Apkarian, N. (2015). Social networks among communities of undergraduate mathematics instructors at PhD granting institutions. In T. Fukawa-Connelly, N. E. Infante, K. Keene, & M. Zandieh (Eds.), *Proceedings of the 18th Annual Conference on Research in Undergraduate Mathematics Education*, 369-373. Pittsburgh, PA.

Technical reports and white papers

Apkarian, N., Smith, W., Vroom, K., Voigt, M., Gehrtz, J., PtC Project Team, & SEMINAL Project Team. (2019). *X-PIPS-M Survey Suite*. Available: <http://bit.ly/2wwcSok>

Apkarian, N., Bonds, M.D., Quardokus Fisher, K., & Burt, B. (2019). *Guide to Inclusion Awareness in the Organization of Knowledge*. Available: <http://bit.ly/33WhzHF>

Apkarian, N., Kirin, D., & Progress through Calculus Team. (2017). *Progress through calculus: Census survey technical report*. Mathematical Association of America. Available: <http://bit.ly/2xcbZTV>

Chapters in edited books

Rasmussen, C., **Apkarian, N.**, Donsig, A., Martinez, A., Tubbs, R., & Williams, M. (in press). Designing and implementing course coordination. In W. M. Smith, M. Voigt, A. Ström, D. Webb, & G. Martin (Eds.), *SEMINAL Student Engagement in Mathematics through an Institutional Network for Active Learning: Cases of Successful Departments* (pp. 154-167).

Quardokus Fisher, K., & **Apkarian, N.** (2018). Instructor networks across 22 STEM departments. In C. Henderson, C. Rasmussen, A. Knaub, **N. Apkarian**, A. J. Daly, & K. Quardokus Fisher (Eds.), *Researching and Enacting Change in Postsecondary Education: Leveraging Instructors' Social Networks* (pp. 96-125). Routledge: New York, NY.

Edited book

Henderson, C., Rasmussen, C., Knaub, A., **Apkarian, N.**, Daly, A.J., & Quardokus Fisher, K., (2018). *Researching and Enacting Change in Postsecondary Education: Leveraging Instructors' Social Networks*. Routledge: New York, NY. <https://doi.org/10.1007/s40753-019-00084-7>

Communication

Apkarian, N., Kirin, D., Gehrtz, J., & Vroom, K. (2019, August 15). Connecting departments, policies, and RUME. [Blog post]. Retrieved from: <https://www.mathvalues.org/masterblog/connecting-departments>

Apkarian, N. (2019, June 13). Evaluating the educational experience in post-secondary mathematics: A new survey suite. [Blog post]. Retrieved from: <https://www.mathvalues.org/masterblog/launchings201906-apkarian>

Apkarian, N., Bonds, M.D., Quardokus Fisher, K., & Burt, B. (2019, May 29). Inclusive Approaches to Reviewing Scholarship: A New Guide. [Blog post]. Retrieved from: https://ascnhighered.org/ASCN/posts/inclusion_guide.html

Apkarian, N., Kirin, D., Gehrtz, J., & Vroom, K. (2017). Math department concerns: Working to bridge the gap between goals and first steps. *MAA FOCUS, February/March*, 35-37.

Voigt, M., **Apkarian, N.**, & Rasmussen, C. (2017). Diverging from the standard fare: Variations in the calculus curriculum. *MAA FOCUS, February/March*, 32-34.

Manuscripts in process

Williams, M., **Apkarian, N.**, Uhing, K., Smith, W. M., Martinez, A., & Rasmussen, C. (in preparation). In the driver's seat: Course coordinators as change agents for active learning in university Precalculus to Calculus 2. [*Builds on 2020 RUME conference paper of the same title, providing theoretical and empirical support for the role of course coordinator as poised to implement instructional change.*]

Dreyfus, T., Rasmussen, C., Tabach, M., & **Apkarian, N.** (in preparation). The complexity of knowledge construction in the classroom. [*Extending on INDRUM 2018 conference paper of the same title, using classroom data to connect the mathematical progress made in small groups and the whole-class discussion. Particular attention is paid to comparing and contrasting ideas which function as if shared in one or the other setting.*]

ADDITIONAL SCHOLARLY ACTIVITIES

Invited presentations / panels

Apkarian, N. (2020). Departmental change. *PCRG Research Webinar*, Rutgers University Proof Comprehension Research Group. [Scheduled December 4, 2020]

Apkarian, N. (2020). Social network analysis & communities in mathematics education. *Mathematics Education Seminar*, Texas State University Department of Mathematics. October 9, 2020. Presented Virtually. San Marcos, TX. [Remote presentation].

Apkarian, N., Uscanga, R., Rahman, Z., & Mesa, V. (2020). Speaking with not speaking for: Thoughtful allyship among womxn in RUME. Panel session presented at *Mentoring and Partnerships for Womxn in RUME (MPWR) 2020*. Boston, MA.

Apkarian, N. (2020). Assessing the Uptake of RBIS by Postsecondary Calculus Instructors. *EMST-RWI Work-in-Progress Colloquium*. University of Michigan. Ann Arbor, MI.

- Apkarian, N.** (2019). Understanding and Improving Undergraduate STEM: Social & Structural Strategies. *Florida International University, Colloquium*. Miami, FL.
- Apkarian, N.** (2019). Invited participant at *Workshop on Scaling-Up and Sustaining Efforts to Improve Student Success in General Chemistry*. American Chemical Society & Association of Public & Land-Grant Universities. Washington, D. C.
- Apkarian, N.** (2019). Keynote speaker at *UTK CoMInDS Workshop*. Sponsored by UTK College of Arts & Sciences, UTK Department of Mathematics, and UTK Office of Research and Engagement. Knoxville, TN.
- Apkarian, N.,** Hagman, J. E., Rasmussen, C., Bressoud, D., Johnson, E., Larsen, S., Gehrtz, J., Vroom, K., & Voigt, M. (2019). The Progress through Calculus project: A national study of precalculus through calculus 2 programs. Special session on NSF DUE projects at *The Joint Mathematics Meetings 2019*. Baltimore, MD.
- Apkarian, N.,** & Rasmussen, C. (2018). Mathematics instruction leadership in undergraduate departments. Special session on Research in Undergraduate Mathematics Education at *The Joint Mathematics Meetings 2018*. San Diego, CA.
- Apkarian, N.,** & McConnell, M. (2017). Social network analysis in DBER and RUME: A new(ish) approach. Targeted session at the *Transforming Research in Undergraduate STEM Education (TRUSE 2017)* conference. St. Paul, MN.
- Apkarian, N.** (2017). Arguing about Sierpinski's Triangle. *California State University, Channel Islands Graduate Student Colloquium*. Camarillo, CA.

Consulting

Cornell University (2019-2021)

- Invited external review of / consultation for ongoing improvement efforts for Calculus 1 and Linear Algebra at Cornell University, with particular attention to the implementation of active learning and other research-based strategies to support student success in mathematics

Florida International University (2019).

- Invited consultation regarding introductory mathematics courses, particularly how to leverage the existing resources and better coordinate ongoing initiatives to support STEM majors

Johns Hopkins University (2019)

- Invited external review of Johns Hopkins University's mathematics service courses program
- Provided recommendations and rationale for increasing support and quality of first- and second-year introductory mathematics course experiences for undergraduate students

MPWR 2016 and Beyond: Fostering Sustainable Networks for Women in RUME (NSF #1553278)

- Development of social network analysis plan for assessing the impact of the Mentoring and Partnerships for Women in RUME conference
- Support for survey development, design, and distribution using Qualtrics

Assessing the Impact of Teaching Faculty in STEM Institutional Transformation (NSF #1612258)

- Consultation about the development of social network analyses to assess the impact of the teaching faculty position in the University of California system on instructional practice
- Support for analysis and interpretation of social network data using R

Awards

2019 Participant, *Future Faculty Development Program*. Virginia Tech Office for Inclusion and Diversity. One of 43 selected from 446 applicants. www.inclusive.vt.edu/Programs/future_faculty.html

2017-18 ARCS Scholar, San Diego Chapter. *Achievement Rewards for College Scientists: Advancing Science in America*.

Additional posters and presentations

- Apkarian, N.**, Alzaga Elizondo, T., Ellis, B., Sánchez Robayo, B., Robbins, C. K., & Johnson, E. (2020). Departmental Change in Reaction to the Threat of Losing Calculus: Three Cases. Presentation in *Contributed Paper Session: Re-envisioning the Calculus Sequence of the Joint Mathematics Meetings 2020*. Denver, CO.
- Apkarian, N.**, Johnson, E., Stains, M., Raker, J. R., Dancy, M. H., Henderson, C. (2019). Awareness and Use of Research-Based Instructional Strategies in STEM. Poster presented at *AAC&U PKAL Transforming STEM Higher Education Conference*. Chicago, IL.
- Dancy, M., **Apkarian, N.**, Henderson, C., Raker, J., Johnson, E., & Stains, M. (2019). Survey of physics, mathematics, and chemistry faculty. *AAPT Summer Meeting 2019*. American Association of Physics Teachers: College Park, MD.
- Apkarian, N.** (2019). Understanding and enacting math department change: An approach in four frames. Poster presented at *ASCN Transforming Institutions Conference 2019*. Accelerating Systemic Change Network: Pittsburgh, PA.
- Rasmussen, C., Hagman, J., & **Apkarian, N.** (2019). Theorizing coordination and the role of course coordinators. Poster presented at *Eleventh Congress of the European Society for Research in Mathematics Education*, Thematic Working Group 14: University Mathematics Education.
- Kerrigan, S., **Apkarian, N.**, & Johnson, E. (2019). Overview of Evaluating the Uptake of Research-Based Instructional Strategies in Undergraduate Chemistry, Mathematics, and Physics. In A. Weinberg, D. Moore-Russo, H. Soto, & M. Wawro (Eds.), *Proceedings of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*, pp. 1130. Oklahoma City, OK.
- Vroom, K. **Apkarian, N.**, Gehrtz, J., Hagman, J. E., Voigt, M., Martinez, A. (2019). Students' reports of precalculus and calculus course experiences. *The Joint Mathematics Meetings 2019*. Baltimore, MD.
- O'Sullivan, M. E., **Apkarian, N.**, Reinholz, D., & Zahner, W. (2018). Transforming introductory STEM courses: Moving beyond instructional improvements. Workshop at *The 2018 Southern California (SoCal) PKAL Regional Network Meeting*. University of California, Los Angeles.
- Apkarian, N.**, Kirin, D., & Vroom, K. (2017). Active learning usage in Precalculus to Calculus 2. *The Joint Mathematics Meetings 2017*: Atlanta, GA.
- Apkarian, N.**, Rasmussen, C., Milbourne, H., & Dreyfus, T. (2016). Ways in which engaging in someone else's reasoning is productive. *Interactive paper session at NCTM Research Conference 2016*.
- Apkarian, N.** (2016). Talking about teaching: Social networks of instructors of undergraduate mathematics. *XXVI International Sunbelt Social Network Conference: Presentation and poster abstracts*, 9-10.

SERVICE, OUTREACH, & ENGAGEMENT

Conference and workshop organization

- Workshop co-organizer: *Initiating, Sustaining, and Researching Mathematics Department Transformation of Introductory Courses for STEM Majors*. Mathematical Sciences Research Institute (MSRI) workshop in the annual series, Critical Issues in Mathematics Education (CIME). April 2021*, Berkeley, CA. (*potentially delayed due to COVID-19)

- Workshop co-organizer: *Learning Processes in mathematics between the whole class, small groups, and individual students*. January 2020. Tel Aviv, Israel. Israeli Science Foundation, Grants No. 438/15
- Member of local organizing committee: *Annual Conference on Research in Undergraduate Mathematics Education*. 2017, 2018. San Diego, CA.
- Workshop co-organizer: *Linked Education Researchers of Networks in Undergraduate STEM*. 2015-2016. San Diego, CA; Portland, OR.
- Conference co-organizer: *Precalculus to Calculus: Insights and Innovations*. June 2016. St. Paul, MN.

Reviewing

- National Science Foundation (NSF) panelist. 2020.
- International Journal of Research in Undergraduate Mathematics Education (IJRUME). 2018-20.
- International Journal of STEM Education. 2018-20.
- Conference on Research in Undergraduate Mathematics Education. 2015-19.
- Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS). 2016-2019.

Outreach

- Facilitator at *Getting Started in Undergraduate Mathematics Education Research*, Project NExT session at the Joint Mathematics Meetings. Denver, CO. January 2020.
- Guest Speaker at *UCSD Undergraduate Mathematics Day*, sponsored by AWM. May 2014.
- Volunteer Mentor for *Expanding Your Horizons*, San Diego. March 2014.

Membership in professional communities

- Mathematical Association of America (MAA)
- Special Interest Group of the Mathematical Association of America in Research in Undergraduate Mathematics Education (SIGMAA on RUME)
- Mentoring and Partnerships for Women in RUME (MPWR)
- Accelerating Systemic Change Network (ASCN)
- ASCN Working Group 1: Guiding Theories of Change