Luyining (Elaine) Gan

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Education

Ph.D. in Mathematics, August 2015 – May 2020, Auburn University, AL, USA
- Advisor: Dr. Tin-Yau Tam
- Co-Advisor: Dr. Ming Liao
- GPA 4.0/4.0

M.S. in Statistics, August 2017 – May 2019, Auburn University, AL, USA
- Advisor: Dr. Peng Zeng
- GPA 4.0/4.0

B.S. in Mathematics, Sept 2011 – June 2015, Jiangxi Normal University, China
B.A. in English, Sept 2011 – June 2015, Jiangxi Normal University, China

Professional Experience

- July 1, 2020 – June 30, 2022   Postdoctoral Scholar at University of Nevada, Reno
- August 2015 – May 2020   Graduate Teaching Assistant, Auburn University
- October 2015 – July 2018   Editorial Assistant of Alabama Journal of Mathematics
- August 2015 – May 2017   Administration Assistant of Department Chair

Skills

- Programming: Python, R, MatLab, C
- Software: SAS, SQL, LaTeX
- Other: TensorFlow, PyTorch, Data Visualization, Machine Learning

Research Interests

Linear Algebra/Matrix Analysis, Lie Algebra, Statistical Learning

Teaching Experience

Courses taught at Auburn University as Graduate Teaching Assistant (2015 – Present):
- Spring 2020   STATs Lab
- Spring 2020   STAT 2510 Statistics for Biological a Health Science
- Fall 2019   MATH 1120 Pre-calculus Algebra
- Fall 2019   STAT 2510 Statistics for Biological a Health Science
- Summer 2019   MATH 1610 Calculus I
- Spring 2019   MATH 1620 Calculus II
- Fall 2018   MATH 1000 College Algebra
- Summer 2018   MATH 1133 Online Course, Precalculus: Trigonometry
- Spring 2018   MATH 1620 Calculus II
- Fall 2017   MATH 2630 Calculus III
- Summer 2017   MATH 2660 Linear Algebra
- Spring 2017   MATH 1610 Calculus I
- Fall 2016   MATH 1610 Calculus I

- Spring 2016   Grader
- Fall 2015   Grader

Statistics Related Projects

- Video prediction for autonomous vehicles using 5G (in progress)
- Classification on Pima Indians Diabetes Database
    Conducted a classification of Pima Indian diabetes database by LDA, QDA, and KNN and improved the accuracy to 97%.
- Comparison of the accuracy of classification by LDA and MLR
    Applied LDA and MLR to the multi-class data for different distributions and compared their performance and accuracy.
- Simple audio recognition
    Applied FFT method on digitalized sound files to get spectrogram image files to recognize simple sound. Classified images by CNN and conducted model validation, whose accuracy achieved 90%.
- Comparison study for Lasso problem: ADMM, AMP and SNA algorithm
    Conducted a comparison among ADMM, AMP and SNA algorithms for the same optimization problem—Lasso problem. Addressed the error and speed of these algorithms and conducted a data simulation to validate and compare the performance of these algorithms. Project implemented in R.

Awards/Honors

- Apr 2020   International Student Recognition Banquet Award, Auburn University, USA
- Mar 2020   Dean's Research Award, Auburn University, USA
- Jan 2020   AMS Graduate Student Travel Grant to 2020 JMM, USA
- Dec 2019   2019 Excellence in Research, Auburn University, USA
- Dec 2019   Don and Sandy Logan Fellowship, Auburn University, USA
- Nov 2019   Graduate Research and Travel Fellowship, Auburn University, USA
- May 2019   Graduate Research and Travel Fellowship, Auburn University, USA
- June 2018   Dr. J. Earl Perry Endowed Summer Graduate Award, Auburn University, USA
- Dec 2017   Don and Sandy Logan Fellowship, Auburn University, USA
- May 2017   David and Valerie Endowed Fund for Excellence, Auburn University, USA
- Jan 2015   Top Ten University Student Award, Jiangxi Normal University, China
- Oct 2014   National Scholarship, China
- Feb 2014   Honorable Mention in Mathematical Contest in Modeling, USA

Papers in Preparation

1. Luyining Gan, Xuhua Liu and Tin-Yau Tam. Sum of adjoint orbits and exponential inequalities.

Submitted

1. Luyining Gan, Wei Gao, Jie Han. Zero-nonzero tree patterns that allow $\mathbb{S}_n^*$.
   (submitted on Linear and Multilinear Algebra. September 23, 2020).

2. Luyining Gan, Jie Han. Hamiltonicity in Cherry-quasirandom 3-graphs.
   (submitted on European Journal of Combinatorics. September 10, 2020).

Publications

1. Luyining Gan, Ming Liao and Tin-Yau Tam. Curvature of matrix and reductive Lie groups. Journal of Lie Theory, 30 (2020), No. 2, 361-370.

2. Gan Luyining, Wu Zhaoyan, and Gong Xiaoli. Cluster synchronization of community network with nonidentical nodes via intermittent pinning control. Chin. Phys. B, 2015, 24(4): 040503.

3. Xiaoli Gong, Luyining Gan, and Zhaoyan Wu. Adaptive impulsive cluster synchronization in community network with nonidentical nodes. International Journal of Modern Physics C, 2016, 27(1): 1650010.

Conferences Attended with Travel Support

1. 2020 mathematics research communities (summer school)
   Finding Needles in Haystacks: Approaches to Inverse Problems using Combinatorics and Linear Algebra, Online, May – August 2020

2. **Contributed Talk** *Differential geometry on matrix groups*
   The 2020 Joint Mathematics Meetings, Denver, Colorado, USA, January 15 – 18, 2020

3. **Seminar Talk** *Curvature of matrix and reductive Lie groups*
   University of Nevada, Reno, USA, December 17, 2019

4. **Invited Talk** *Differential geometry on matrix groups*
   The 8th International Conference on Matrix Analysis and Application, University of Nevada at Reno, Nevada, USA, July 15 – 18, 2019.

5. The 14th Workshop on Numerical Ranges and Numerical Radii, Technical University of Munich Garching, Munich, Germany, June 13 – 18, 2018.

6. The 2018 Southern Regional Algebra Conference, Auburn University at Montgomery, Alabama, USA, April 20 – 22, 2018.

7. The 2017 Langenhop Lecture and SIU Mathematics Conference, Southern Illinois University Carbondale, Illinois, USA, May 15 – 16, 2017.

8. The 2017 Southern Regional Algebra Conference, University of South Alabama, Alabama, USA, March 17 – 19, 2017.

9. The 2017 Joint Mathematics Meetings, Atlanta, Georgia, USA, January 4 – 7, 2017.

10. The 2016 Southern Regional Algebra Conference, Auburn University, Alabama, USA, March 18 – 20, 2016.

11. The 2016 Recent Advances in Linear Algebra and Graph Theory, University of Tennessee at Chattanooga, Tennessee, USA, March 5 – 6, 2016.

12. The 5th International Conference on Matrix Analysis and Application, Nova Southeastern University, Florida, USA, December 17 – 20, 2015.

13. The 2015 International Workshop on Matrices and Operators, Shaanxi Normal University, Shaanxi, China, July 19 – 21, 2015.

14. The 2015 International Workshop on Matrix Inequalities and Matrix Equations, Shanghai University, Shanghai, China, June 28 – 30, 2015.

Activities and Services

- Graduate Student Leader, Auburn University (August 2018 – May 2020)
- Judge, South's BEST Robotics Championship (December 2, 2018).
- Judge, War Eagle BEST Robotics Competition (October 20, 2018).
- Event assistant, Auburn University Division B State Science Olympiad (March 31, 2018).
- Give talks to help Department chair recruit graduate students for Auburn University. Universities visited include Yunnan University, Guiyang Normal University and Jiangxi Normal University, China. (December 17 – 29, 2017).
- Judge, South's BEST Robotics Championship (December 3, 2017).
- Graduate teaching assistant mentor (Fall 2017).