CURRICULUM VITAE – STEVEN SENGER

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Missouri State University
Cheek Hall, 23M
Springfield, MO 65897

CITIZENSHIP: United States of America

POSITIONS HELD:

Assistant professor at Missouri State University, Fall 2014-present Postdoctoral researcher under the direction of Robert Coulter at the University of Delaware, Fall 2011–Spring 2014.
Research assistantship under the direction of Alex Iosevich at the University of Rochester, Fall 2010.
Research assistantship under the direction of Pete Casazza for the Frame Research Center, University of Missouri - Columbia, Fall 2008–Fall 2009.

EDUCATION:

BS in Electrical Engineering, University of Missouri - Columbia, 2005
BS in Computer Engineering, University of Missouri - Columbia, 2005
BS in Mathematics, University of Missouri - Columbia, 2005
MA in Mathematics, University of Missouri - Columbia, 2009
PhD in Mathematics, University of Missouri - Columbia, 2011

SERVICE:

JOURNALS:
Managing editor at the Online Journal of Analytic Combinatorics (OJAC).
Editor at the International Journal of Mathematics and Statistics (IJMS).
Referee for the Electronic Journal of Combinatorics (EJC), Journal of Number Theory (JNT), and Australasian Journal of Combinatorics (AJC).

COMMITTEES:
Member, Committee on General Education and Intercollegiate Programs (2015–Present).
Co-chair, Secretary, CNAS Diversity Committee (2015–Present).
Chair, CGEIP Subcommittee on Diversity (2016–2017).

TEACHING EXPERIENCE:

GRADUATE COURSES TAUGHT:
Harmonic Analysis and Geometric Combinatorics (Topics course)
An Analytic Introduction to Fractals (Reading course)
Non-Euclidean Geometry
UNDERGRADUATE COURSES TAUGHT:
Discrete Mathematics
Calculus I
Calculus II
Calculus III (Multivariable)
Elements of Calculus (for non-science majors)
Finite Mathematics
Pre-Calculus Mathematics
College Algebra for Non-Calculus Bound Students
College Algebra for Calculus Bound Students.

OTHER TEACHING EXPERIENCE:
Missouri Scholars Academy (summer school for gifted high school students)
Independent Study (Readings courses for undergraduates)
Calculus II (Teaching Assistant).

BOOKS:

The Erdős Distance Problem, with Julia Garibaldi and Alex Iosevich, AMS Student Library Series, 56, (2011).

PAPERS:

Dimensional lower bounds for Falconer type incidence and point configuration theorems, with Jonathan DeWitt, Kevin Ford, Eli Goldstein, Steven J. Miller, Gwyneth Moreland, and Eyvindur A. Palsson, to appear soon in Journal d'Analyse.

Sharpness of Falconer's $\frac{d+1}{2}$ estimate, with Alex Iosevich, Annales Academiae Scientiarum Fennicae Mathematica, vol 41, 2016, pp. 713–720.

Sharpness of Falconer's estimate and the single distance problem in $\mathbb{Z}_q^d$, with Alex Iosevich, Combinatorial and Additive Number Theory: CANT 2011 and 2012, Springer (2014) pp. 63–78.

On the number of distinct values of a class of functions with finite domain, with Robert Coulter, Ann. Comb. 18 (2014), no. 2, 233–243.

Tracking Time-dependent Scalar Fields with Swarms of Mobile Sensors, with Josh Kirby, Marco Montes de Oca, Louis F. Rossi, and Chien-Chung Shen,

Proc. of the 7th IEEE International Conference on Self-Organizing Systems (SASO '13), Philadelphia, PA, USA. T. Holvoet et. al. (Eds.) IEEE Computer Society Press, Los Alamitos, CA, USA, pp. 159–168, (2013).

A note on the multiplicative structure of an additively shifted product set, $AA+1$, Integers: The Electronic Journal of Combinatorial Number Theory, A34, (2013).

Distance graphs in vector spaces over finite fields, coloring and pseudo-randomness, with Derrick Hart, Alex Iosevich, Doowon Koh, and Ignacio Uriarte-Tuero, Recent Advances in Harmonic Analysis and Applications, Volume 25, 139–160, (2013).

Swarm Interpolation Using an Approximate Chebyshev Distribution, with Joshua Kirby, Marco A. Montes de Oca, Louis F. Rossi, and Chien-Chung Shen, Swarm Intelligence: Lecture Notes in Computer Science: 7461, pp. 324–331, (2012).

On sets of directions determined by subsets of $\mathbb{R}^d$, with Alex Iosevich and Mihalis Mourgoglou, Journal D'Analyse, 116 no. 1, 355–369, (2012).

A Furstenberg-Katznelson-Weiss type theorem on $(d + 1)$-point configurations in sets of positive density in finite field geometries, with David Covert, Derrick Hart, Alex Iosevich, and Ignacio Uriarte-Tuero, Discrete Math. 311, no. 6, 423–430, (2011).

A low complexity replacement scheme for erased frame coefficients, with Bernhard Bodmann, Peter G. Casazza, and Gitta Kutyniok, Proceedings of SPIE, Wavelets XIII, San Diego (2009) pp. 744600-1-10.

Error correction for erasures of quantized frame coefficients, with Bernhard Bodmann, Peter G. Casazza, and Gitta Kutyniok, Proceedings of SAMPTA (2009), http://www.latp.univ-mrs.fr/SAMPTA09.

Orthogonal systems in vector spaces over finite fields, With Alex Iosevich, Electronic Journal of Combinatorics, Volume 15, (2008).

Acquiring and maintaining abstract landmark chunks for cognitive robot navigation, with R. H. Luke, J. M. Keller, and M. Skubic, Intelligent Robots and Systems, 2005. (IROS 2005). 2005 IEEE/RSJ International Conference on.

SELECTED INVITED LECTURES:

February 2, 2017, Analysis Seminar, Ohio State University, *Sharpness of Falconer's exponent for two points, and related problems on three points.*
September 8, 2016, First Vietnam Workshop on Graph Theory and Discrete Geometry, Vietnam Institute for Advanced Study in Mathematics, *Polychromatic point configurations.*
January 10, 2015, San Antonio - Joint Meetings of the MAA and AMS, *Value sets of functions with finite domain, with applications to planar functions.*
October 22, 2014, Missouri State University - MAA Student Chapter Meeting, *Some Elementary Questions in Discrete Geometric Combinatorics*
May 22, 2013, CUNY - Combinatorial and Additive Number Theory Conference, *A multi-scale approach to the Erdős-Falconer type single distance problems*

May 23, 2012, CUNY - Combinatorial and Additive Number Theory Conference, *Combinatorial estimates of the size of an image set*

October 20, 2011, Gettysburg College - Math Colloquium, *Brothers and laser beams: a brief peek at incidence geometry via graph theory*

March 24, 2011, Indiana University, *On the relationships between several problems in geometric combinatorics*

December 10, 2010, Rochester Institute of Technology - IEEE Meeting, *From design to implimentation: Vision and VLSI*

December 6, 2010, University of British Columbia - CMS Meeting, *Some connections between discrete and continuous geometric combinatorics, with recent illustrative results– sharpness examples.*

October 14, 2010, CUNY, *Some connections between discrete and continuous geometric combinatorics, with recent illustrative results– hinge estimates.*

November 10, 2010, University of Rochester, *Geometric interactions with some problems in additive number theory.*

May 21, 2008, CUNY - Combinatorial and Additive Number Theory Conference, *Orthogonal systems in vector spaces over finite fields.*

POSTERS:

February 2009, University of Maryland, Norbert Wiener Center - February Fourier Talks, *Orthogonal systems in vector spaces over finite fields,*

February 2012, University of Maryland, Norbert Wiener Center - February Fourier Talks, *Reliability of swarming algorithms for mobile sensor network applications*

SYNERGISTIC ACTIVITIES:

Faculty at Missouri Scholars Academy, a highly selective summer school for gifted high school students at the University of Missouri - Columbia.

Regular presenter at Math Circles program for high school students in Delaware.

Employee of the Year, Facilities (Climbing Wall), University of Missouri Recreation Complex, 2010.

Familiarity with C, Java, Matlab, and assembly programming– specifically for mathematics and engineering.

Teaching Assistant training course under Sandi Athanassiou, Summer 2005.

Experience with Sakai, WebWork, and Blackboard educational tools.