

Viswambhara Makam

Department of Mathematics
University of Michigan
Ann Arbor, MI - 48104

RESEARCH INTERESTS

Representation theory, invariant theory, algebraic complexity and tensors.

EDUCATION

Ph.D., Mathematics (current)
[University of Michigan](#)
Expected April 2018
Advisor: Harm Derksen

Bachelor of Science (Hons.), Mathematics and Computer Science
[Chennai Mathematical Institute](#), India
Completed Aug 2013
CGPA: 9.75/10

PAPERS & PREPRINTS

- **Hilbert series and degree bounds for matrix (semi)-invariants**, Journal of Algebra **454**, May 2016: 14-28.
- **Polynomial degree bounds for matrix semi-invariants**, with Harm Derksen, Advances in Mathematics **310**, April 2017: 44-63.
- **On non-commutative rank and tensor rank**, with Harm Derksen, Linear and Multilinear algebra, published online, 2017.
- **Generating invariant rings of quivers in arbitrary characteristic**, Journal of Algebra **489** Nov 2017: 435-445.
- **Degree bounds for semi-invariant rings of quivers**, with Harm Derksen (accepted to the Journal of Pure and Applied Algebra).
- **Explicit tensors of border rank at least $2d - 2$ in $K^d \otimes K^d \otimes K^d$ in arbitrary characteristic**, with Harm Derksen (arXiv preprint).
- **Extensions between Verma modules for dihedral groups**, with Gurbir Dhillon (arXiv preprint).
- **On the tensor rank of 3×3 permanent and determinant**, with Sidharth Krishna (arXiv preprint).
- **Algorithms for orbit closure separation for invariants and semi-invariants of matrices**, with Harm Derksen (arXiv preprint).
- **Weyl's polarization theorem for matrix semi-invariants in positive characteristic**, with Harm Derksen (arXiv preprint).
- **Highly entangled tensors**, with Harm Derksen (in preparation).
- **Invariant theory and Wheeled PROPs**, with Harm Derksen (in preparation).

TALKS

- Nov 2017, *Commutative Algebra and Algebraic Geometry seminar*, UC Berkeley.
- Oct 2017, *Geometry seminar*, UIUC.
- Sep 2017, *Geometry seminar*, Texas A&M University.
- Apr 2017, *Graduate student combinatorics conference 2017*, University of Kansas.
- Nov 2016, *Fourth conference on geometric methods in representation theory*, University of Missouri.
- Oct 2016, *CS Colloquium*, Rice University.
- Aug 2016, *ICRA 2016*, Syracuse University
- Jun 2016, Chennai Mathematical Institute.
- Apr 2016, *Algebra and Number Theory seminar*, Louisiana State University.
- Apr 2016, *CS Theory seminar*, NYU.
- Apr 2016, *Algebra and Representation Theory seminar*, University of Oklahoma.
- Feb 2016, *Combinatorics seminar*, University of Michigan.

TEACHING

University of Michigan

- Instructor for Calculus 1, Math 115, Fall 2017.
- Instructor for Calculus 2, Math 116, Fall 2016.
- Instructor for Calculus 2, Math 116, Winter 2016.
- Teaching assistant for Differential Equations, Math 216, Winter 2015.
- Instructor for Calculus 2, Math 116, Fall 2014.
- Instructor for Calculus 1, Math 115, Winter 2014.
- Instructor for Pre-calculus, Math 105, Fall 2013 .

Chennai Mathematical Institute

- Teaching assistant for Complex Analysis, Winter 2013.

HONOURS & AWARDS

KVPY Fellowship

Awarded the prestigious Indian science fellowship

August 2010

AMTI National Mathematics Talent Contest

Secured 1st rank in the country

2007-08

AMTI National Mathematics Talent Contest

Secured 5th rank in the country

2008-09

SERVICE

Organizer for Student Representation theory seminar at University of Michigan.