

# Akira Willox<sup>1</sup>

Curriculum Vitae

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Updated: January 30, 2026

*Current mathematical interests: Representation Theory of the Symmetric Group and Algebraic Geometry*

## EDUCATION

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### University of Wisconsin–Madison

September 2024–May 2028 (expected)

B.S., Mathematics (Honors) and Engineering Physics

GPA: 3.92/4.0, Dean's List (all semesters)

## RELEVANT COURSEWORK

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- Representation Theory (Independent Study)
  - Advisor: Joshua Mundinger
  - Covered Etingof et al. *Introduction to Representation Theory* ch. 1–4, Okounkov–Vershik “A New Approach to Representation Theory of Symmetric Groups. II”.
  - Proved that Young tableaux and complex irreps of the symmetric group have isomorphic branching graphs via the action of Coxeter generators on Gelfand–Tsetlin basis vectors.
- Linear Algebra (Independent Study)
  - Advisor: Matthew Bloss
  - Read all of Hoffman & Kunze; independently developed a method to compute A001970 (number of  $n \times n$  Jordan forms over characteristic-0 fields  $\bar{k}$ ) using recursive counting of submatrices.
- Abstract Algebra I<sup>†</sup> and II<sup>†</sup> (*Dummit & Foote*)
- Analysis I<sup>†</sup> and II<sup>\*†</sup> (*Rudin; Roos & Andreas*)
- Topology I<sup>\*†</sup> (*Munkres*)
- ODEs<sup>\*†</sup> (*Hirsch, Smale, and Devaney*)

\* In progress

† Honors

## DIRECTED READING PROJECTS

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### Finite Character Theory

UW–Madison, Spring 2025

Covered James–Liebeck chapters 1–19 (finite groups; characters; orthogonality relations)

Presented an application to molecular vibrations with Christos Kokinakos and Viktor Velev

### Geometric Invariant Theory

UW–Madison, Fall 2025

Read ch. 1–3 of Newstead *Introduction to Moduli Problems and Orbit Spaces*

## TEACHING EXPERIENCE

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### Lead Math Tutor, Achievement Connections | Madison, WI

October 2025–present

One-on-one high school tutoring in Algebra I and Geometry to address opportunity gaps

### Online Tutor

April 2023–present

Volunteer video tutoring in mathematics (High School Algebra I–Calculus III)

## SKILLS

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- Programming: Python, Java

## OTHER

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### Math Club

Fall 2025–present

Attended weekly symposia on various topics

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<sup>1</sup>Legal name: [deadname] Willox