Accessing MIDFIELD: A Workshop for R beginners

FIE 2019

Wednesday October 16, 2019 5 – 8 pm

MIDFIELD

Multiple-Institution Database For Investigating Engineering Longitudinal Development

Workshop Agenda

Min	Topic
10	Introductions and Objectives
5	The data structures in MIDFIELD and midfieldr
30	Finding stories in the data
35	Starting with R (tutorial)
15	— break —
20	Elements of effective graphs
5	Introduce midfieldr
50	Starting with midfieldr (tutorial)
10	Next steps

Facilitators

Matthew Ohland, MIDFIELD Director/PI

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Russell Long, MIDFIELD Managing Director

Richard Layton, MIDFIELD Data Display Specialist

Professor of ME, Rose-Hulman

Marisa Orr, MIDFIELD Associate Director

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Susan Lord, MIDFIELD Institute Director

Professor and Chair of Integrated Engineering, University of San Diego

Facilitators

Hasan Al Yagoub, Graduate Research Assistant, Engineering Education, Purdue

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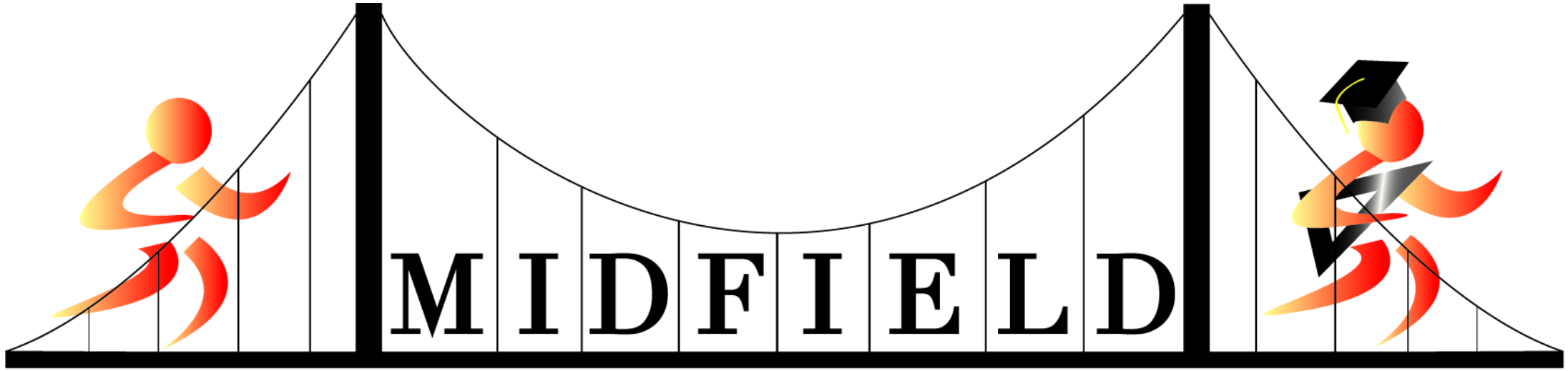
Workshop Objectives

By the end of this workshop, participants should be able to

- Describe key variables in the MIDFIELD data
- Select academic programs and populations to study
- Use **midfieldr**, an R package specifically designed for use with MIDFIELD, to compute persistence metrics
- Explore and tell a story from MIDFIELD data Explain key features of effective data displays

Introduction to MIDFIELD



Multiple-Institution Database For Investigating Engineering Longitudinal Development

Multiple
I nstitution
D atabase
F or
I nvestigating
E ngineering
L ongitudinal
D evelopment

Whole-population data for institutions and time period

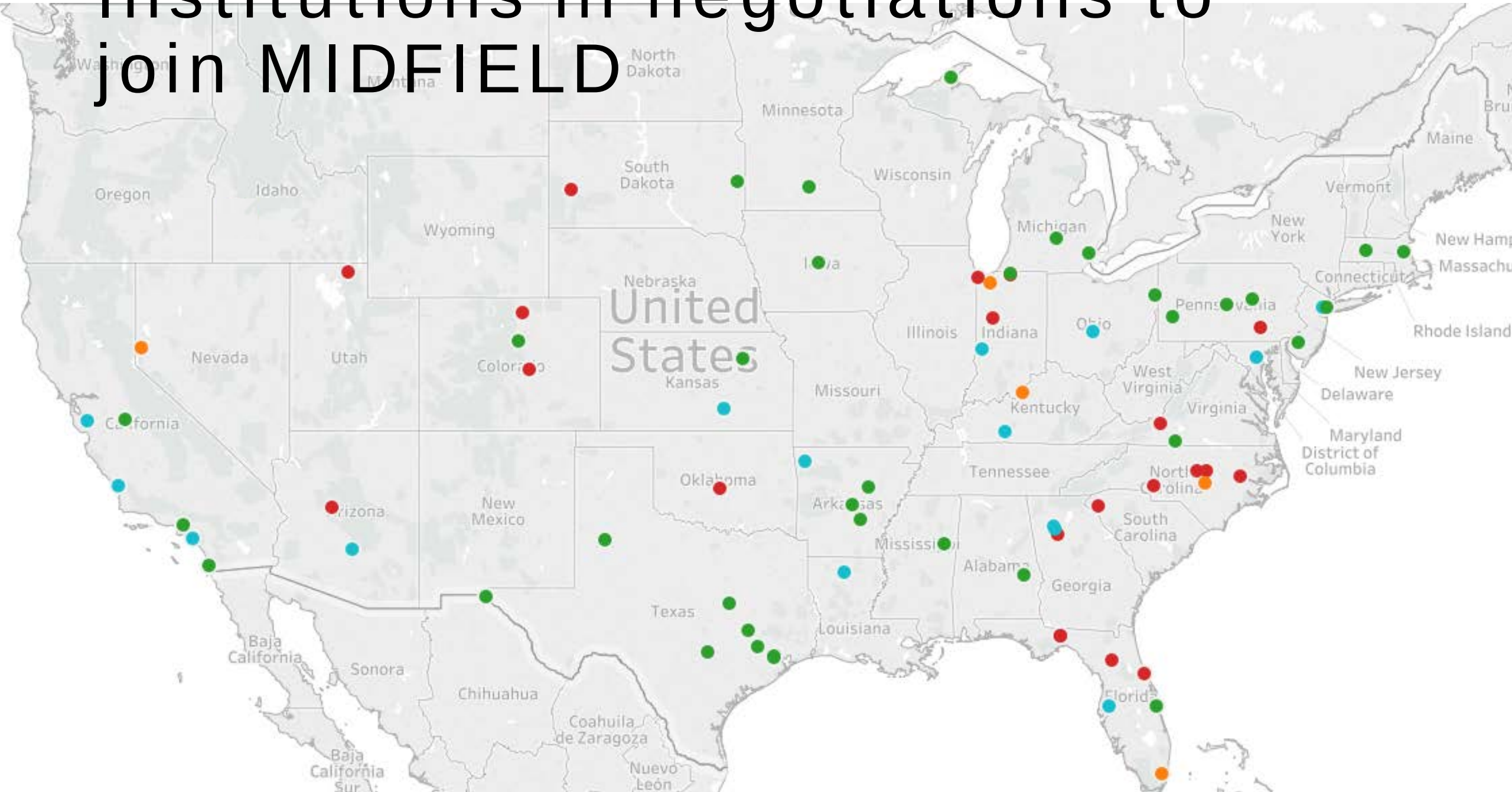
Current dataset

- 22 institutions
- 1.5 million unique students in all departments
- 250,000 unique engineering students, approximately 1/7 US engineering enrollment

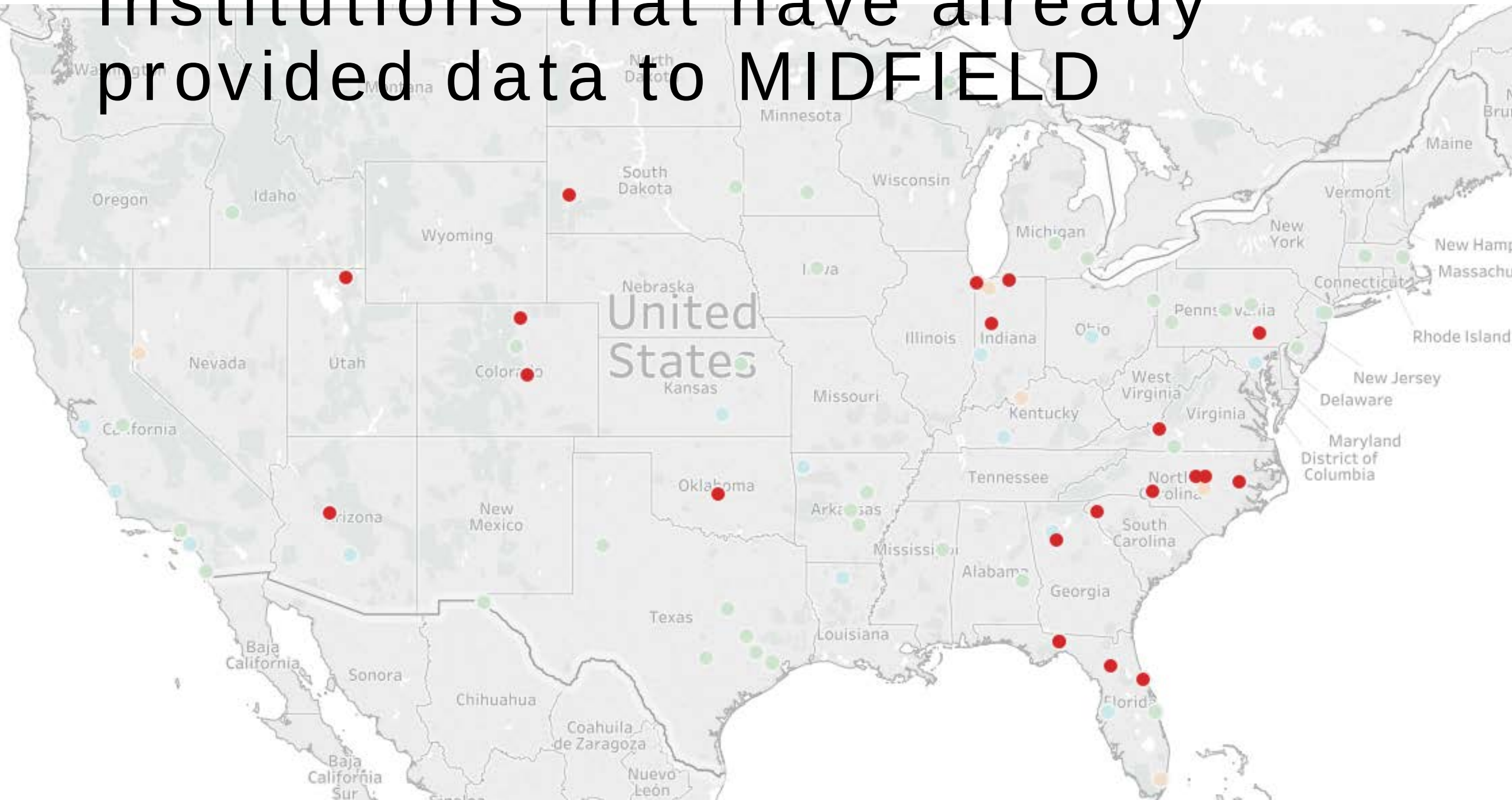
5-year expansion plan in progress

- Total of 100+ diverse institutions
- 1/2 US engineering enrollment

Institutions in negotiations to join MIDFIELD



Institutions that have already provided data to MIDFIELD

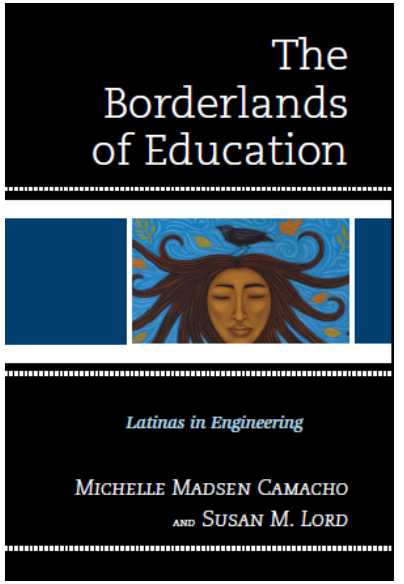


Different uses of MIDFIELD

- Demographic data:
  - Who enrolls? Where are they coming from?
- Graduation data:
  - Who graduates? How long does it take?
- Term data:
  - When do students leave? How do students move among majors? Why do students change majors and what happens?
- Course data:
  - How do grade distributions vary by section? To what extent do students intentionally co-enroll in classes?

What have MIDFIELD researchers accomplished?

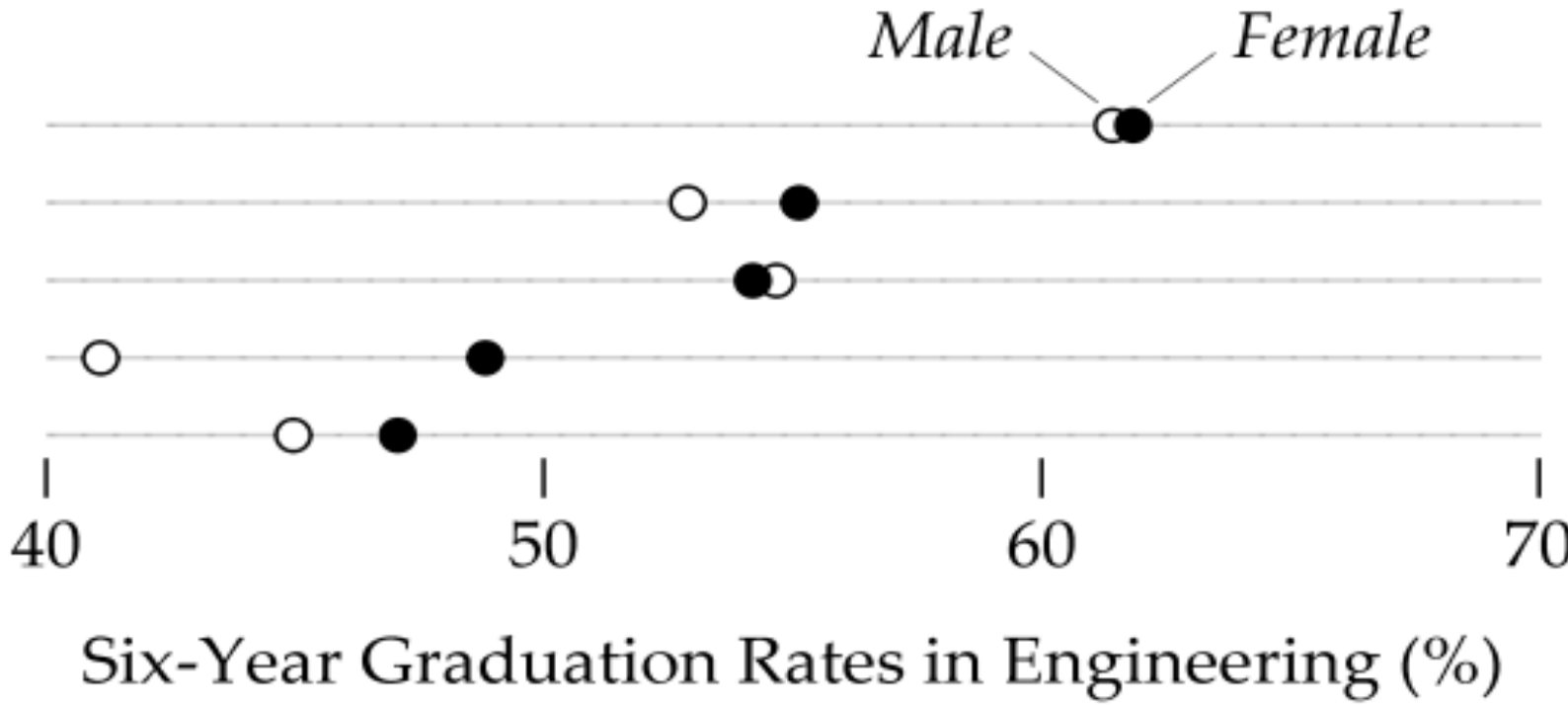
- Many publications in journals and conference proceedings, conference presentations, multiple book chapters, and one entire book.
- 4 journal best paper awards, two conference best paper awards, and other recognitions (e.g. WEPAN, ECEDHA).
- Panel discussions, invited workshops and talks, keynote addresses, publicity in various media outlets.



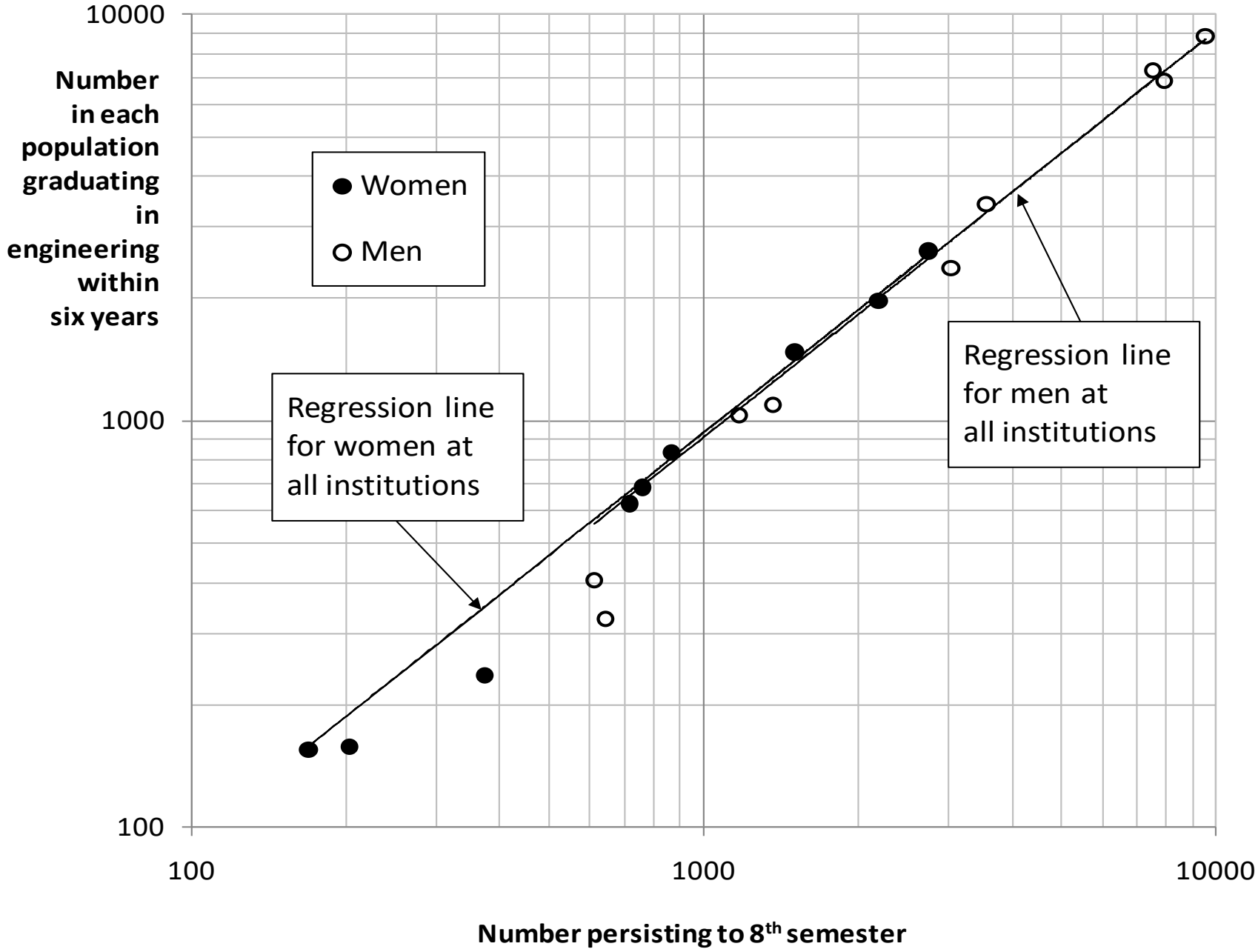
Women in graduate at the same rates as men.

All Engineering Matriculants

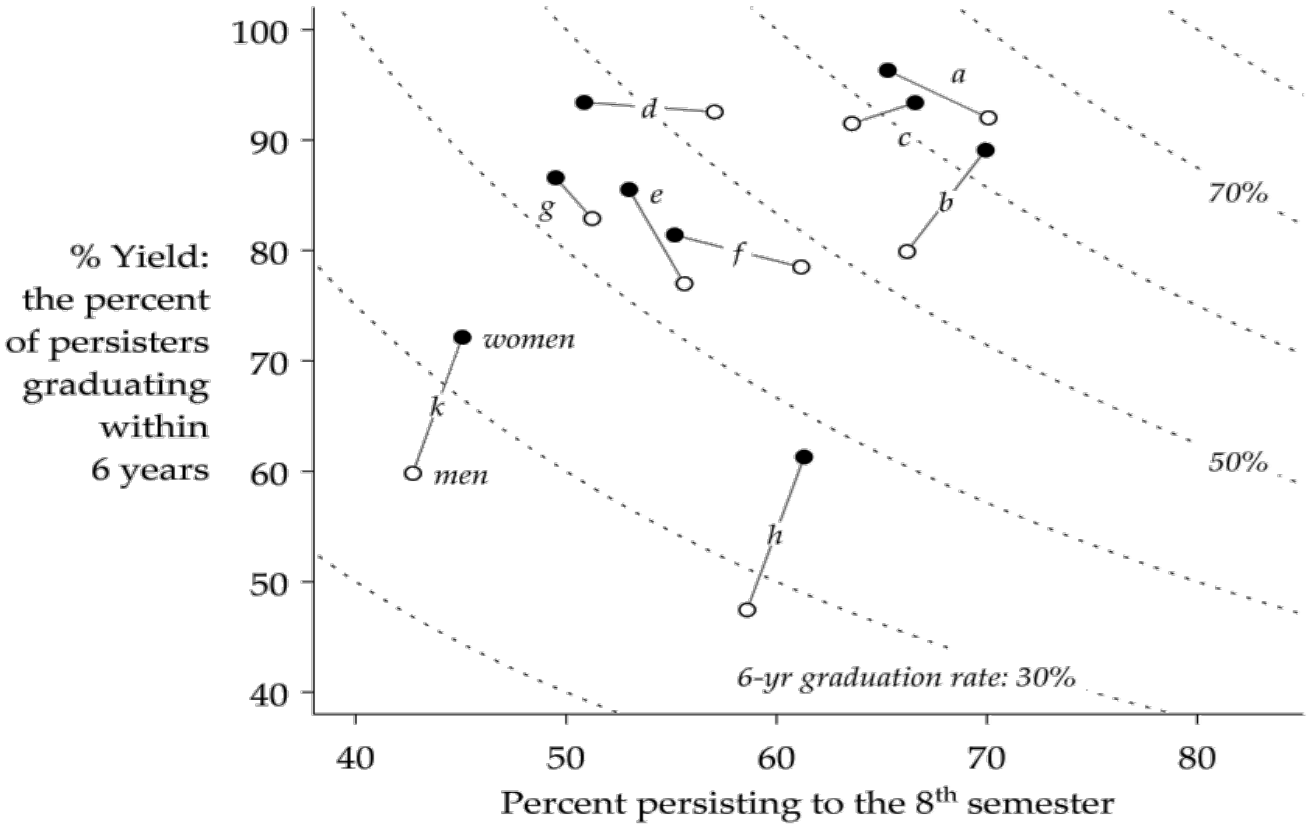
	n_F	n_M
Asian	1001	3927
Hispanic	390	1607
White	9997	45291
Black	3957	6624
Native-Am	68	258

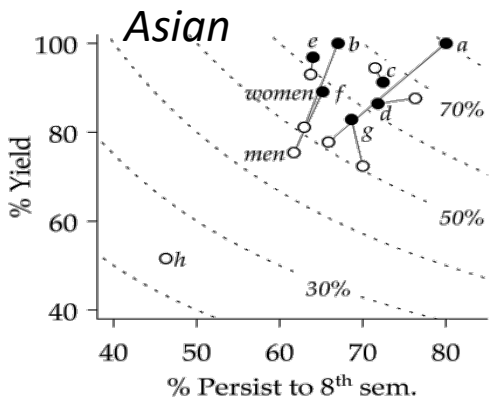


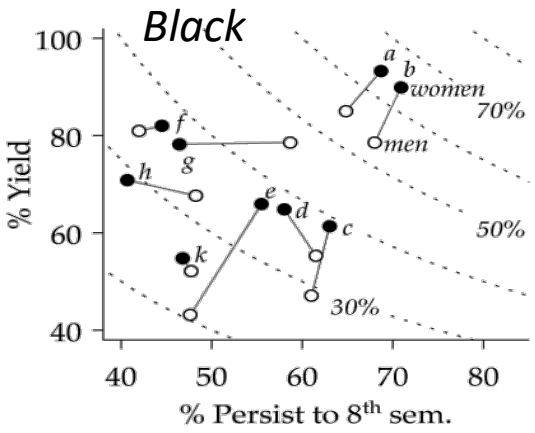
Eight-semester persistence is a good predictor of six-year graduation… but not for everyone.

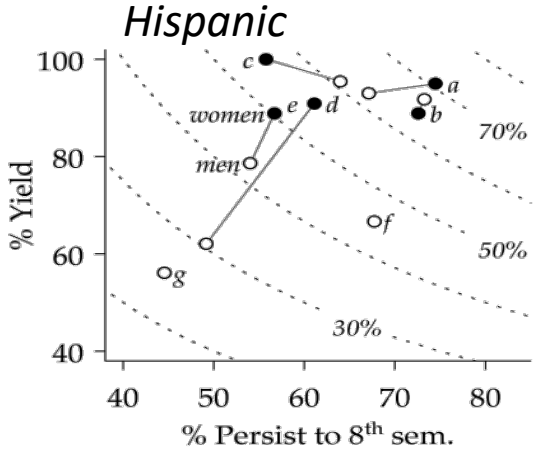


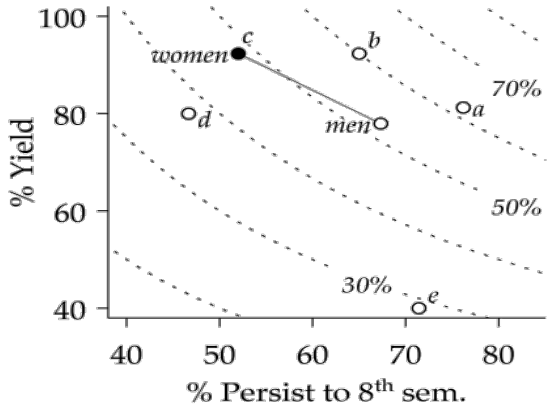
The aggregate experience doesn't represent the experience of any racial/ethnic group.

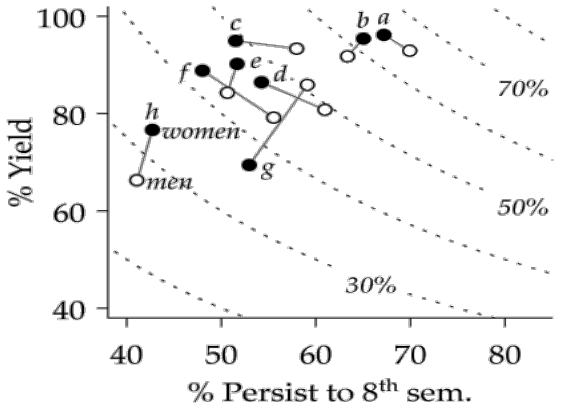












Some disciplines are better than others at graduating students… but some of the students who leave will graduate in other engineering majors.