

Impacts of Collegiate Spending Patterns on Student Retention Rates

Presentation by Scott Schumann



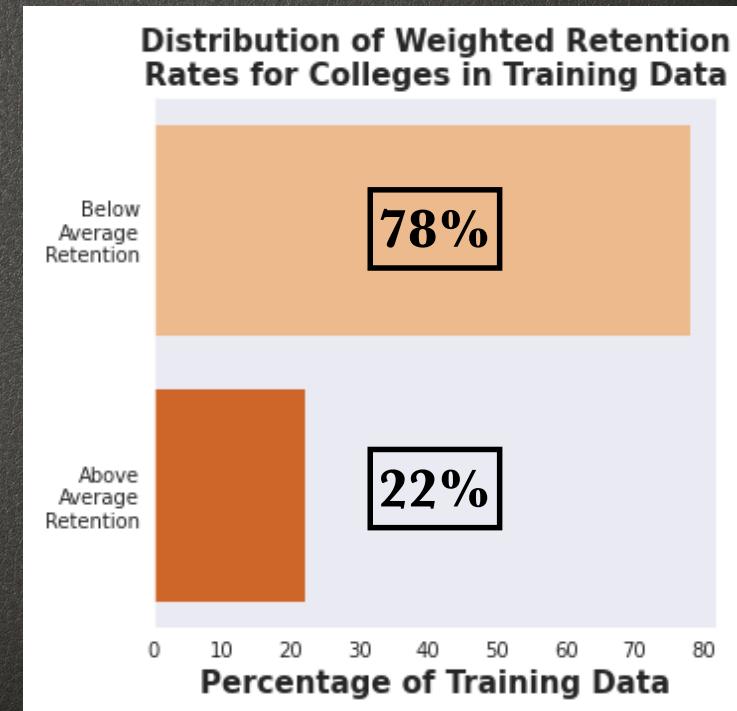
Business Understanding

- **Student retention rates**
 - Important student success metric at US colleges
 - 81% National Average (according to NCES)
- “The College Athletics Arms Race”
 - Only 25/1100 NCAA programs generate more revenue than they spend



The Data

- Three sources:
 - Knight Commission on Intercollegiate Athletics
 - The US Department of Education Equity in Athletics Data Analysis
 - National Center for Education Statistics Integrated Postsecondary Education
- Data Characteristics
 - 166 unique US collegiate institutions
 - 15 years (2005–2019)
 - 2077 observations
 - 62 features



Modeling

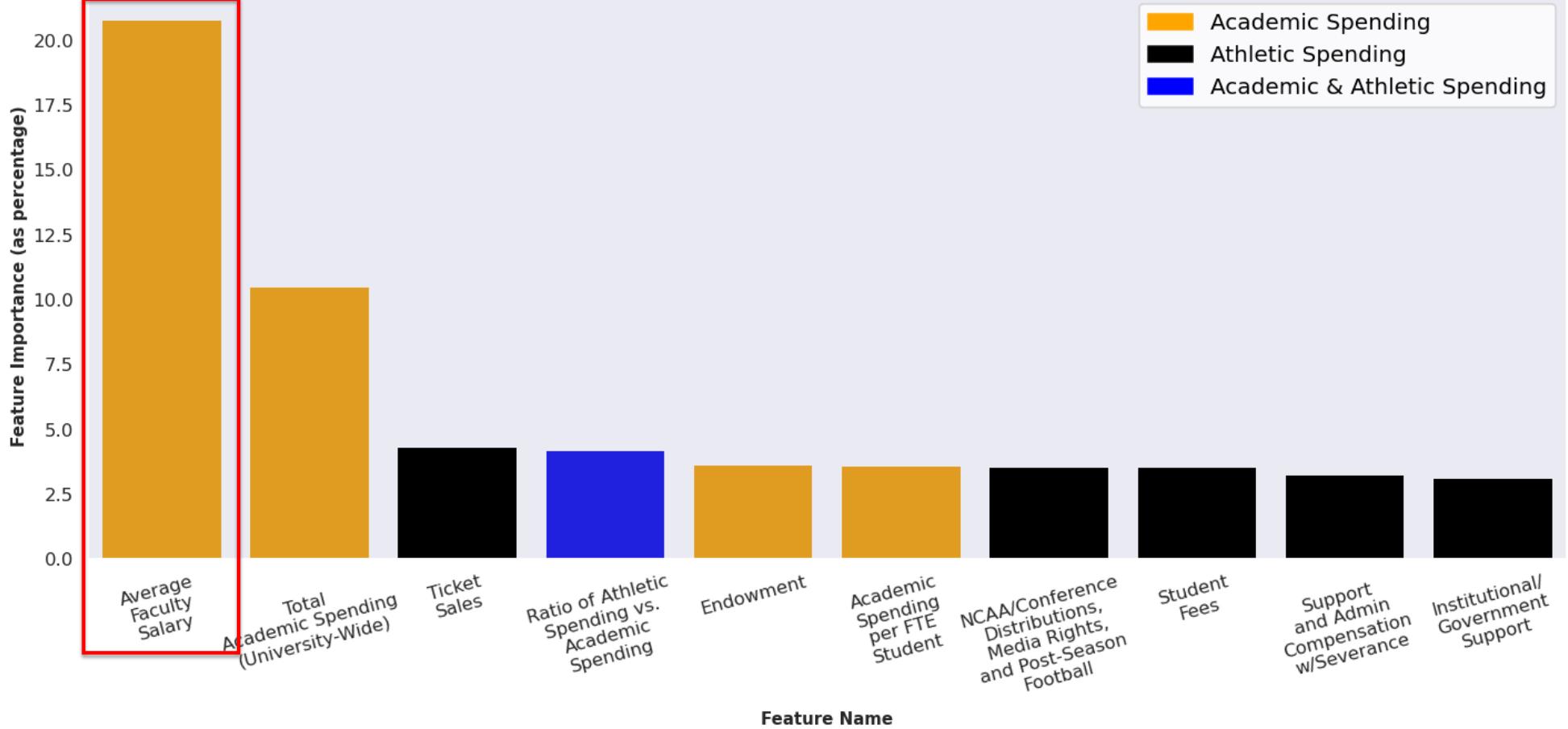
- Final Model —> Random Forest Grid Search
- Emphasized precision to minimize false positives:
 - “A school is identified as having above average retention rates but in fact does not”

Confusion Matrix on Holdout Test Set

| | | | |
|-------------------|--------|--------|-------------------|
| True Negatives – | 76.92% | 0.96% | – False Positives |
| False Negatives – | 5.77% | 16.35% | – True Positives |

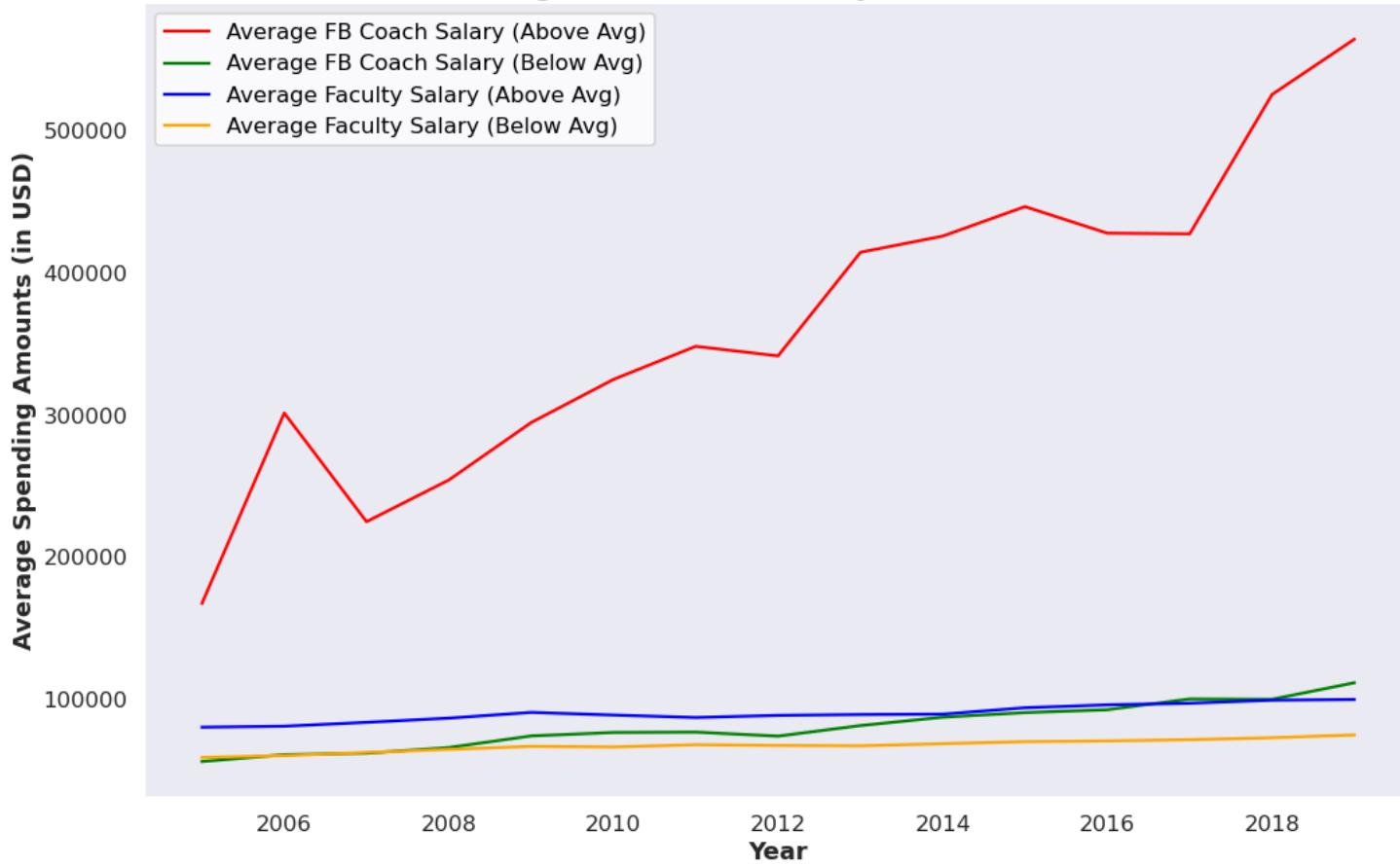
Results

Feature Importances from Random Forest Grid Search Model



Results

Average Faculty Salary &
Average Football Coach Salary from 2005-2019



Rate of Increase

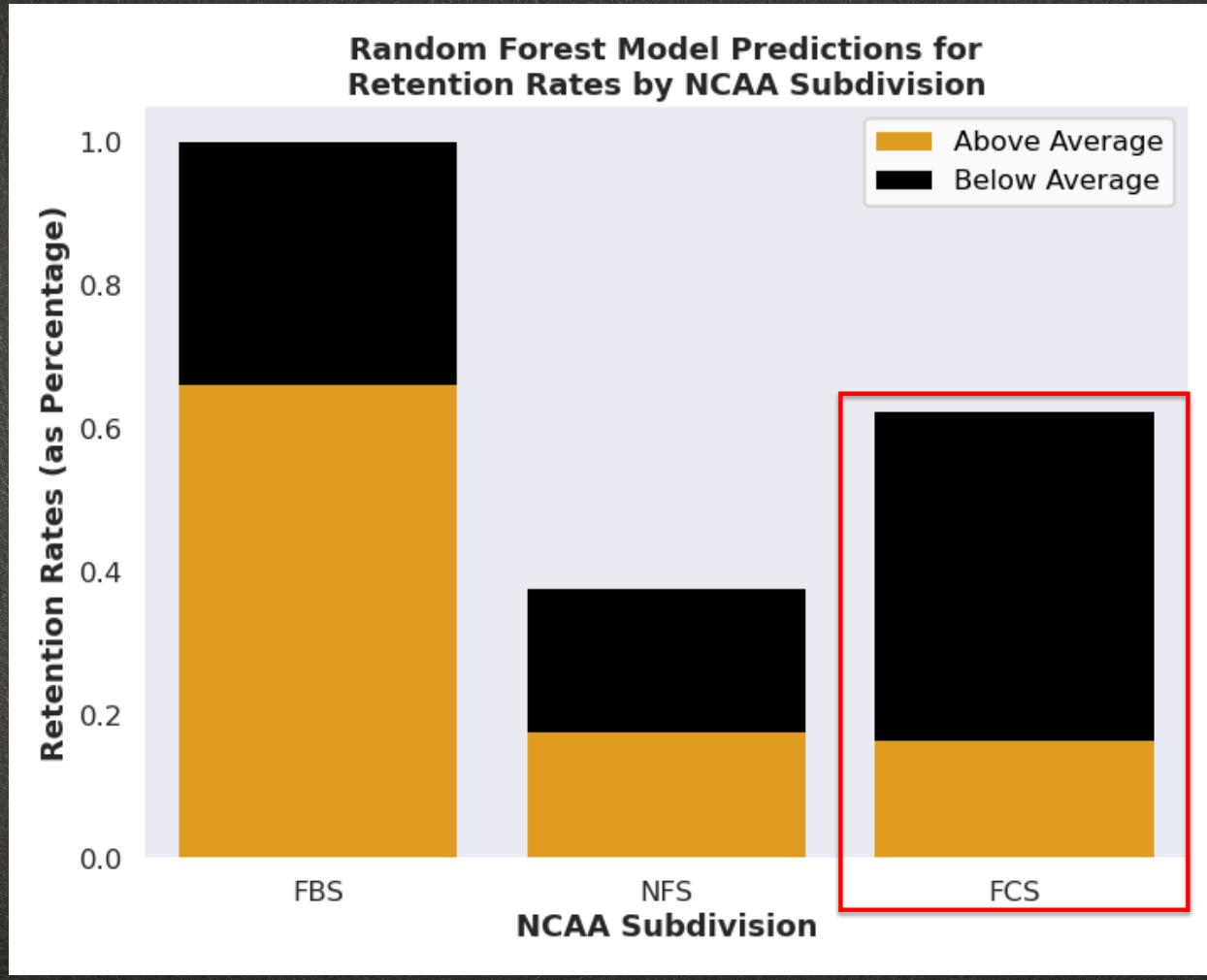
236.6%

98.2%

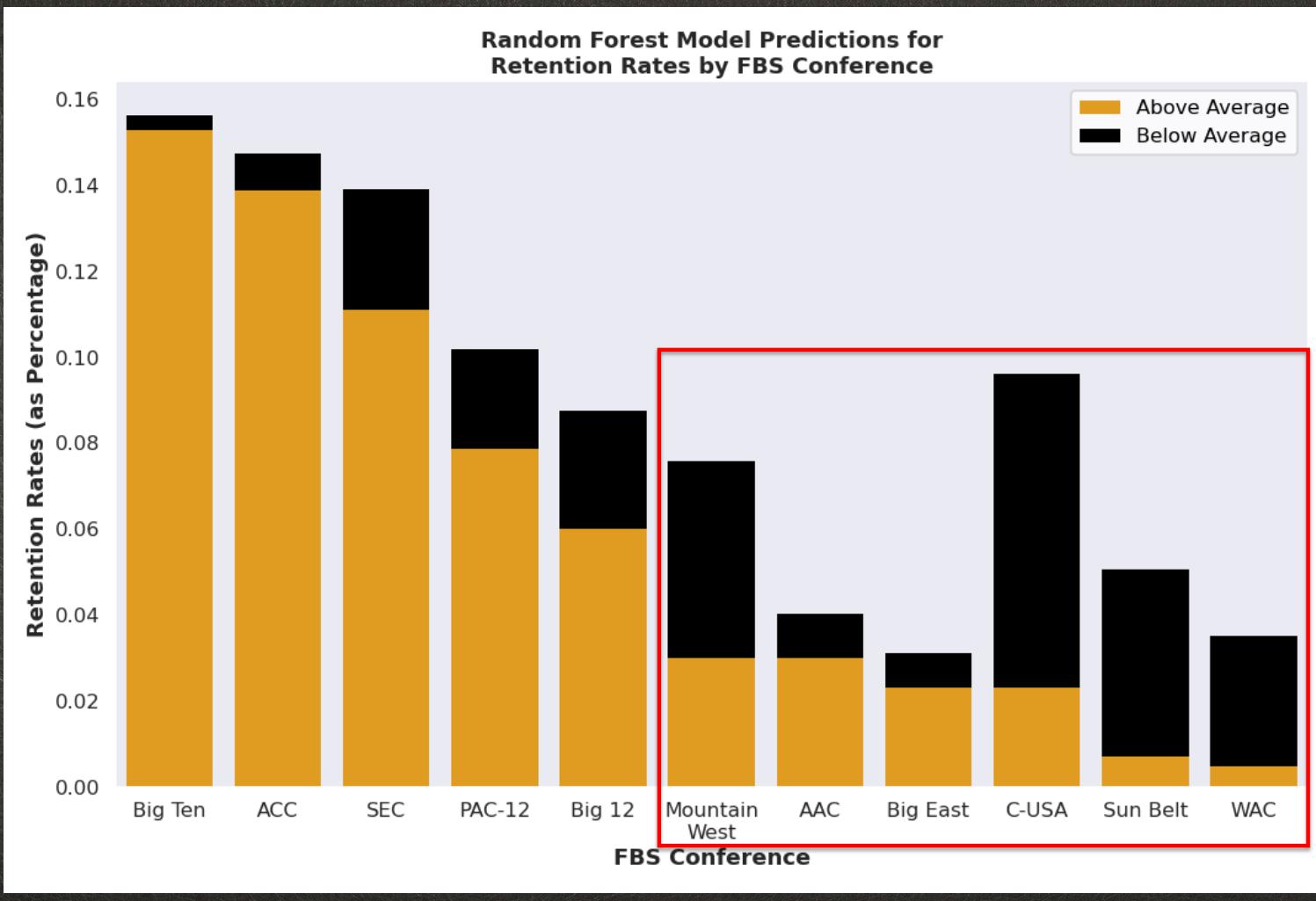
24.2%

26.8%

Results



Results



Conclusions

- Academic Spending is more important for student retention
- Colleges should find a better balance between athletic and academic spending



Limitations & Future Directions

- Academic department-level spending/other student success metrics
- Athletic spending on sports other than football
- More colleges/years



Thank you!

- **Github:** https://github.com/Shoemaker703/college_retention
- **LinkedIn:** <https://www.linkedin.com/in/scott-schumann>
- **Medium:** <https://medium.com/@Shoemaker703>

