Preparing Underrepresented and First-Generation Students for Careers in Biomedical Big Data Science

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Cal State, Monterey Bay

- Four-year public university
- Monterey County, California
- ~7100 students
  - Hispanic Serving Institution (42%)
  - 63% Women, 37% Men
  - 53% First-Generation
  - 36% Low-Income
  - 50% Under-Represented Minorities

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Barriers to Diversity in Data Science

- Exposure
  - What is Data Science?
- Preparation
  - Professional Development
  - Courses and Programs
- Access to Resources
  - Research Experiences
  - Training

Curriculum Development

- Data Science Concentration (Computer Science B.S.)
- Bioinformatics Concentration (Biology B.S.)
  - Fall 2019
- Statistics Concentration (Mathematics B.S.)
  - Statistics B.S. (Fall 2019)
- Statistics Minor

Interdisciplinary Future

- Integrated Pathways
  - Data Science in the Lower Division
    - Community Colleges aka “Feeder” Schools
  - Data Science Minor
  - Joint Capstone Projects

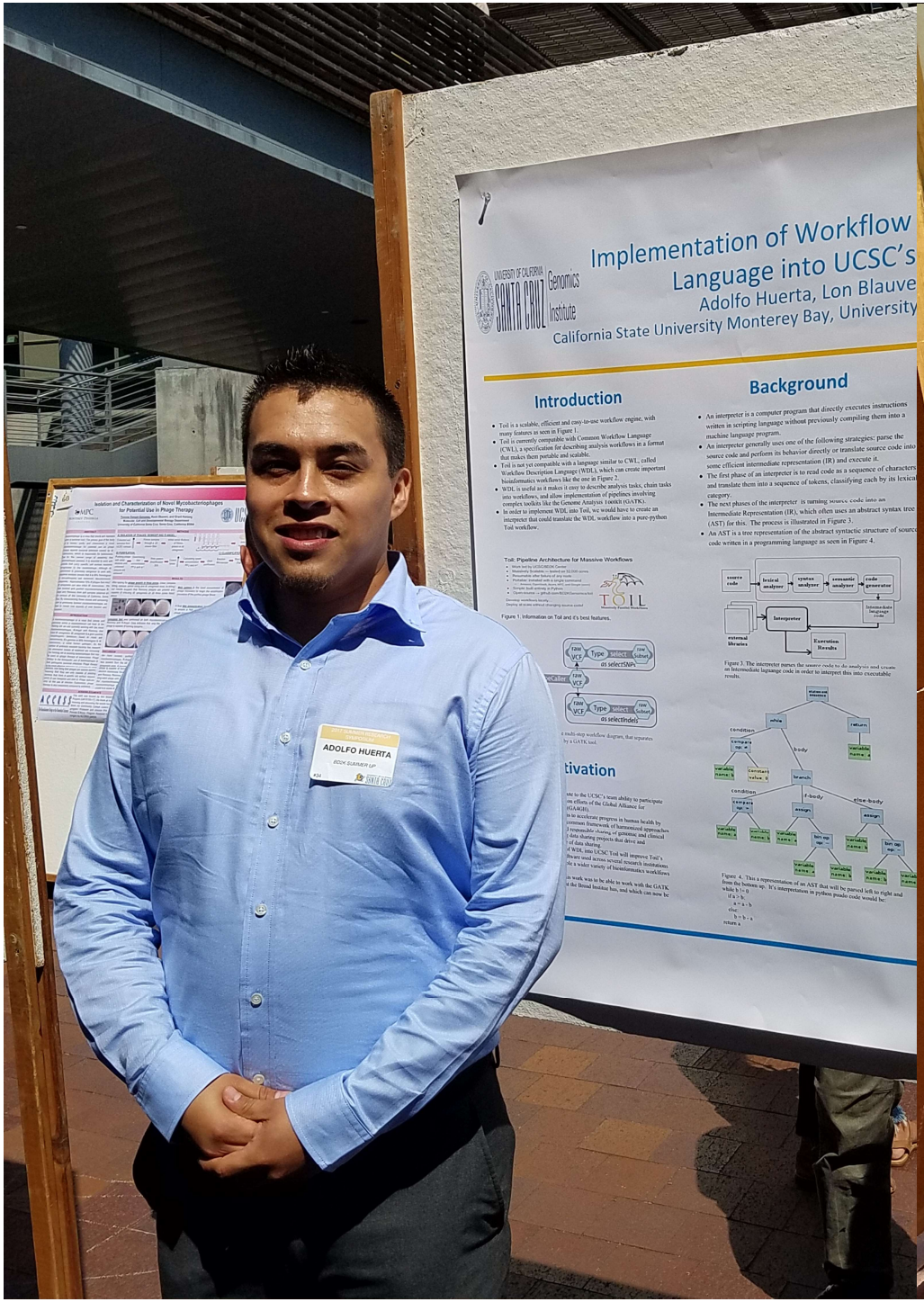
- General Education
  - Data Literacy
  - Data Visualization

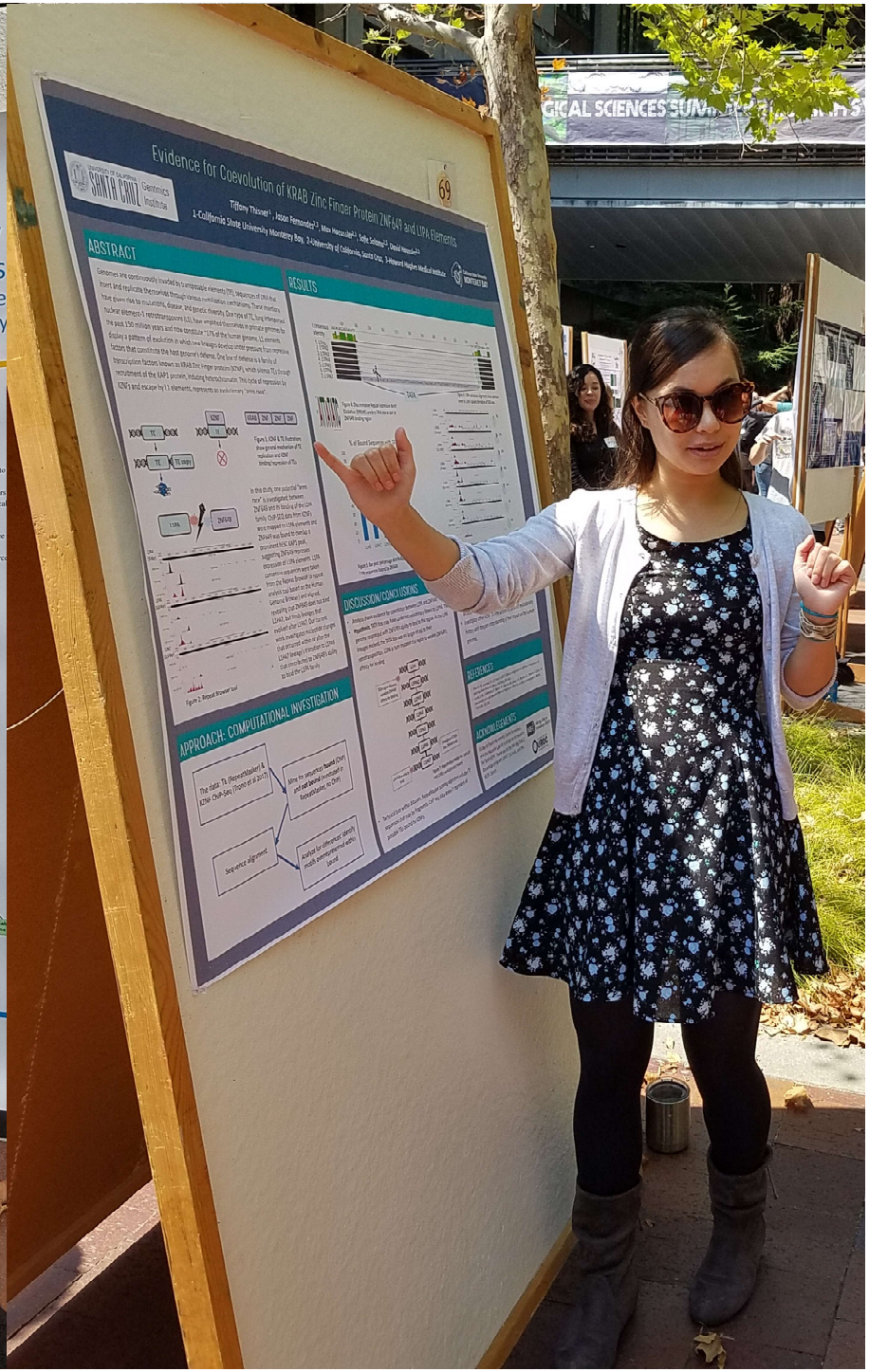
Faculty Development

- If Faculty are not trained, they cannot train students
- Training opportunities in data science skills
  - Software Carpentry Workshops
  - Data Carpentry Workshops
  - Summer Institutes, University of Washington
- Research collaborations with research institutions and labs

Student Research

- Partnership with UC, Santa Cruz *Center for Big Data in Translational Genomics*
  - 8 weeks of summer research at UCSC
- Mentoring
- Professional Development
  - Writing Workshops
- Conference Presentations
  - SACNAS, CSUPERB


Implementation of Workflow
Language into UCSC's
Adolfo Huerta, Lon Blauve
California State University Monterey Bay, University
Introduction
Background
ADOLFO HUERTA


Evidence for Coevolution of KRAB Zinc Finger Protein ZNF649 and LIPA Elements
ABSTRACT
RESULTS
DISCUSSION/CONCLUSIONS
APPROACH: COMPUTATIONAL INVESTIGATION
REFERENCES

What's Next

- Continue collaboration with UCSC
  - Support student AND faculty research
- Build new relationships
  - Research institutions
  - National labs
- Strategic Plan for Data Science Programs
  - Psychology and Health Sciences
- Keep Focus on Student Success

Thank you!

National Institutes of Health

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Undergraduate Research Opportunities Center

UROC

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SANTA CRUZ | Genomics Institute

California State University
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Reference

Canner, J.E., A.J. McEligot, M.E. Pérez, L. Qian, X. Zhang (2017). Enhancing Diversity in Biomedical Data Science. *Ethnicity and Disease,* 27(2): 107-116.