Data-Driven Education and Athletics Outreach

Program Overview

BYU PRISM
MODEL OPTIMIZE CONTROL

John Hedengren

5 February 2025

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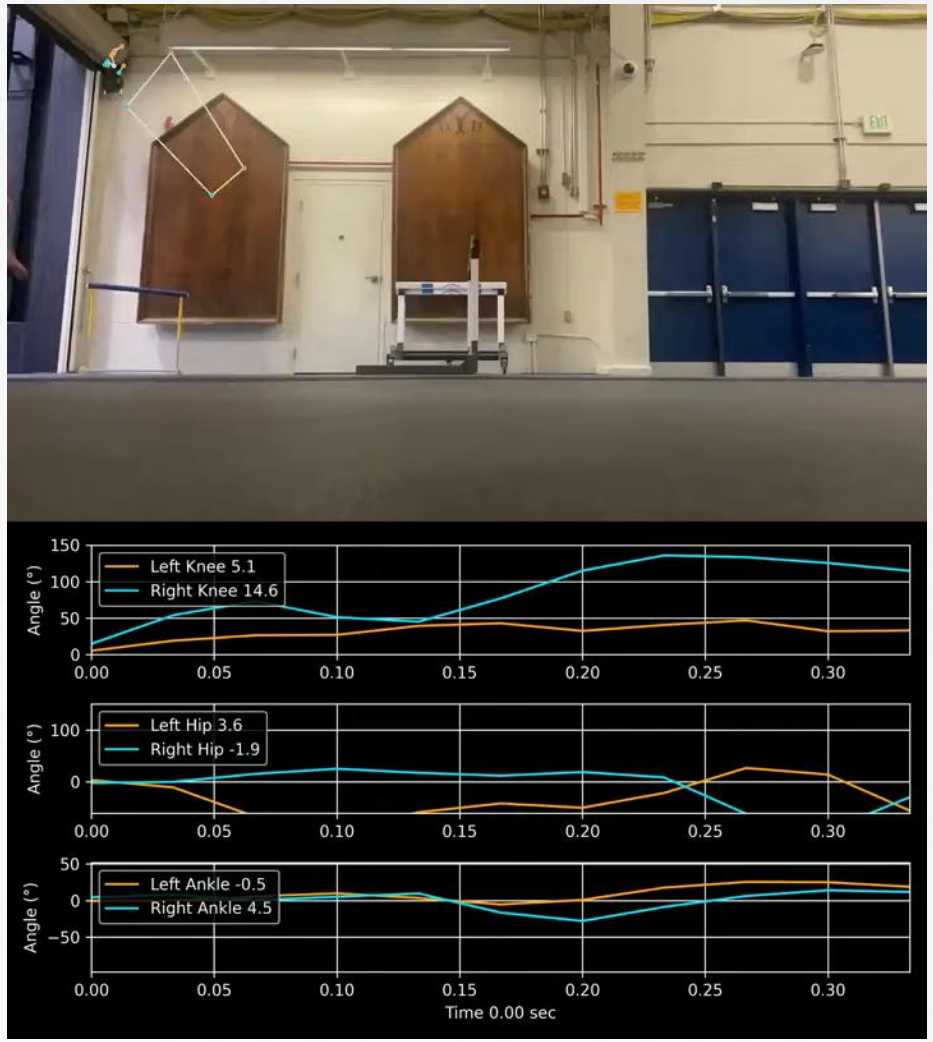
Data Driven Engineering

BYU Chemical Engineering

IRA A. FULTON COLLEGE OF ENGINEERING

Meeting Agenda

- Team Introduction
- Accomplishments
- Outreach Activities



Team Lead: McGyver Clark

- BYU Visiting Scholar
- Tasks:
  - Leading the team and technology development
  - Developed APP at app.alphapeak.io
  - Outreach to West Hurdle Group, Roadrunners, Timpview HS
  - Outreach scheduled through March with High School, College, and Club teams

Team Member: Violett Taylor

- Major: Chemical Engineering
- Tasks:
  - Hurdles domain development
  - Digitized materials for LLM
  - Hurdle Form Analysis

Team Member: Heather Thayer

- Major: Chemical Engineering
- Tasks:
  - Python and Data-Science introduction
  - Develop throws domain knowledge
  - Digitize material for LLM
  - Discus Throw Analysis

Team Members: Davin and Creed Thompson

- Major: Computer Science
- Tasks:
  - Training data correlation to injury prediction
  - Davin: Collaborate with Violett Taylor on hurdles app development
  - Creed: Collaborate with Heather Thayer on throws app development

Team Member: Dallin Draper

- Major: Data-Science (Statistics)
- Tasks:
  - Sprints domain development
  - Coaches Analysis/ Athlete Recommendation
  - Digitized materials for LLM
  - Sprint Form Analysis

Team Member: Luke Grundvig

- Major: Computer Science
- Tasks:
  - Data from .FIT files (watch data source)
- Collaborating with Chris Kuchin (advisor)

Team Member: McKenna Pouwer

- Major: Public Health
- Tasks:
  - Careers in Data-Science presentation
  - Outreach Program

Project Advisor: Chris Kuchin

- Tasks:
  - Experienced Developer
  - Prior Qualtrics Employee
  - Currently at Route
  - Avid Runner and Coach
  - Timing App: rslts.run

BYU Faculty: John Hedengren

- BYU Faculty
  - Chemical Engineering
  - Data-Science and Machine Learning

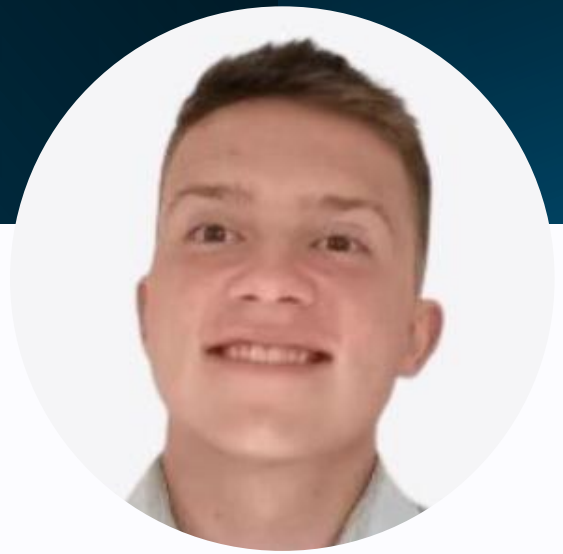
BYU Faculty: Iain Hunter

- BYU Faculty
  - Exercise Science and Biomechanics professor
  - Collaboration with USA Track and Field

Graduate Student: Luke Vankeersblick

- BYU Graduate Research
  - Biomechanics and artificial intelligence
  - AI Form analysis research

Team Members Ramping Up:
Nathan Brimhall, Zarek Proffit, Oliver Mott



- Majors: 2 x Chemical Engineering, 1 x Undecided
- Oliver Tasks:
  - LLM integration
  - Digitalization Efforts

Curriculum Accomplishments

- Teaching ChEn 536 (Machine Learning and Dynamic Optimization) to undergraduates and graduate students (36 students)
- Revised Graduate Seminar course ChEn 691/791 to include technical communication materials and Streamlit app-building exercise (55 students)
- Developed the Roadrunner High School Outreach Program
  - Empowering athletes with data analytics
  - Biomechanical analysis for high school track teams

Outreach Program Highlights

- Program Objectives:
  - Awareness of Data-Driven Decision Making
  - Educational and Career Path Guidance
  - Biomechanical Analysis
- Program Components:
  - Interactive Seminars
  - Biomechanical Analysis Sessions
  - Team Data Review and Recommendations
  - Education and Career Pathways
  - Individual Guidance Sessions

https://www.roadrunners.club/outreach/analytics

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Outreach Visit Schedule

- Visit 1: Field Session (Practice)
  - Program Introduction
  - Athlete Survey
  - Warm-Up and Instruction
  - Biomechanical Analysis

https://www.roadrunners.club/outreach/visit https://youtube.com/shorts/51e34xZgI0c

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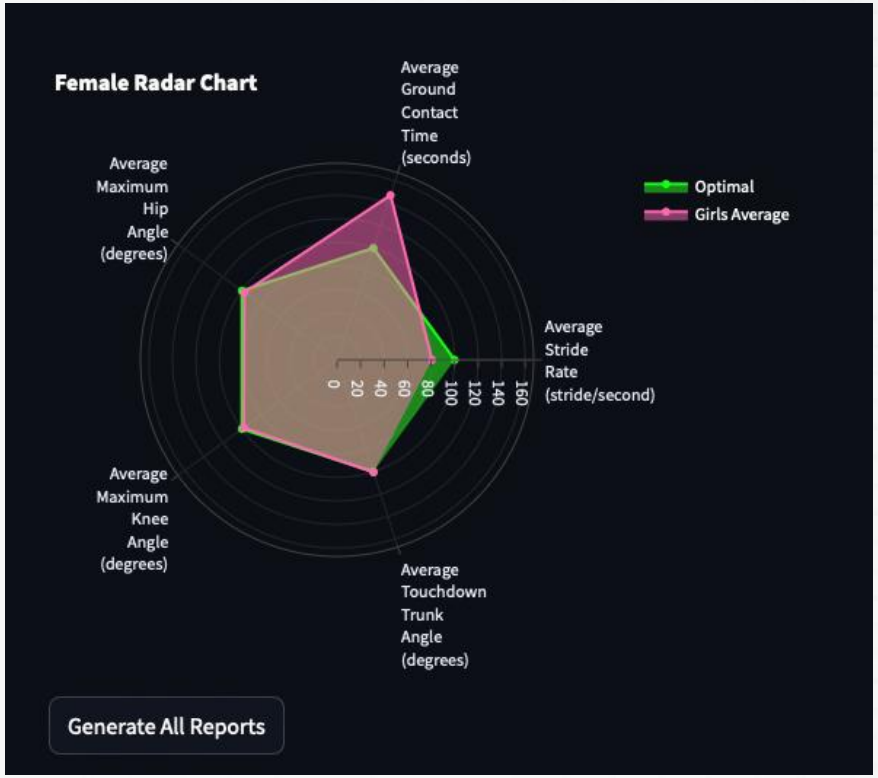
Outreach Visit Schedule

- Visit 2: Classroom Session
  - Role of Data in Sports
  - Team Data Review
  - Performance Improvement Recommendations
  - Education and Career Pathways
  - Individual Guidance



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Outreach Program Accomplishments

- 5 Visits Completed
- 236 Athletes Analyzed
- 7 Visits scheduled
- 2 Teams adopted for follow-up visits