RUMEN UNDERSTANDING THROUGH MILLIPEDE-ENGINEERED NAVIGATION AND SENSING (RUMENS)



- Abbey Knoepfel, Colin Nitroy, Shashank Priya
- Materials Research Institute, Penn State, University Park, PA
- **Collaboration: Virginia Tech (Robin White) and Purdue University (Richard Voyles)**
- Indwelling Robotics to collect realtime data for learning and enhancing the quality of animal models.
- Combination with sensors, networking, and cloud computing to develop data analytics.





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BIO-INSPIRED ROBOTICS















Penn State Dairy Barn Complex

OVERVIEW OF BIO-INSPIRED FISH ROBOT

PennState



Swimming Performance





Swimming Performance - Straight



Rumen Robot



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- An Android application was developed to send specific swimming parameters to control the robot's swimming
- Allows the development of specific gaits to achieve different behaviors
- Can also read sensor data being output from on-board IMU
 Will be further developed to also read from sensors on robot to analyze data about its environment

Swimming Performance - Left



Swimming Performance - Right





Integration of Wearable Sensors and Testing on Ruminants

Fully Shaded Barn



Partially Shaded Pasture



Sunny Pasture



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