



Course
**BIG DATA AND DIGITAL TOOLS APPLIED TO
LIVESTOCK PRODUCTION**

September 25 – 29, 2023

Instructors

Dr. Guilherme J. M. Rosa

(<https://www.gimrosa.org/>): Professor at the Department of Animal & Dairy Sciences and Department of Biostatistics & Medical Informatics, University of Wisconsin Madison

Dr. Joao Dorea

(<https://dorealab.webhosting.cals.wisc.edu/>): Professor at the Department of Animal & Dairy Sciences and Department of Biological Systems Engineering Informatics, University of Wisconsin-Madison.

Course description

Graduate level course (PhD and advanced MS) for researchers working in all areas of animal sciences, such as nutrition and physiology, management, genetics and reproduction, in industry or academia, especially those interested on data analytics and precision management of livestock. Statisticians, computer scientists, and data scientists interested on learning about potential applications in animal science can also benefit from the course. The course will cover key concepts and techniques related to statistics and machine learning applied to high-dimensional data in livestock, including data from sensors, imaging, genomics, farm-recorded data from management software, and publicly available datasets. The course is structured with 4 sessions per day, Monday through Friday – except on Wed afternoon (free time to foster discussion and networking among participants), including expositive lectures and demos with real data and useful software and algorithms that will be shared with the participants.

Topics

- Big Data and Data Science in Livestock
- Planning Research Studies in Animal Sciences
- Database Management
- Multidimensional Regression and Classification
- Machine Learning Techniques
- Image Processing and Analysis
- Infrared Spectroscopy and Hyperspectral Imaging
- Wearable Sensing Technology
- Deep Learning
- Genomics Data
- Mining Operational Farm data
- Cloud Computing