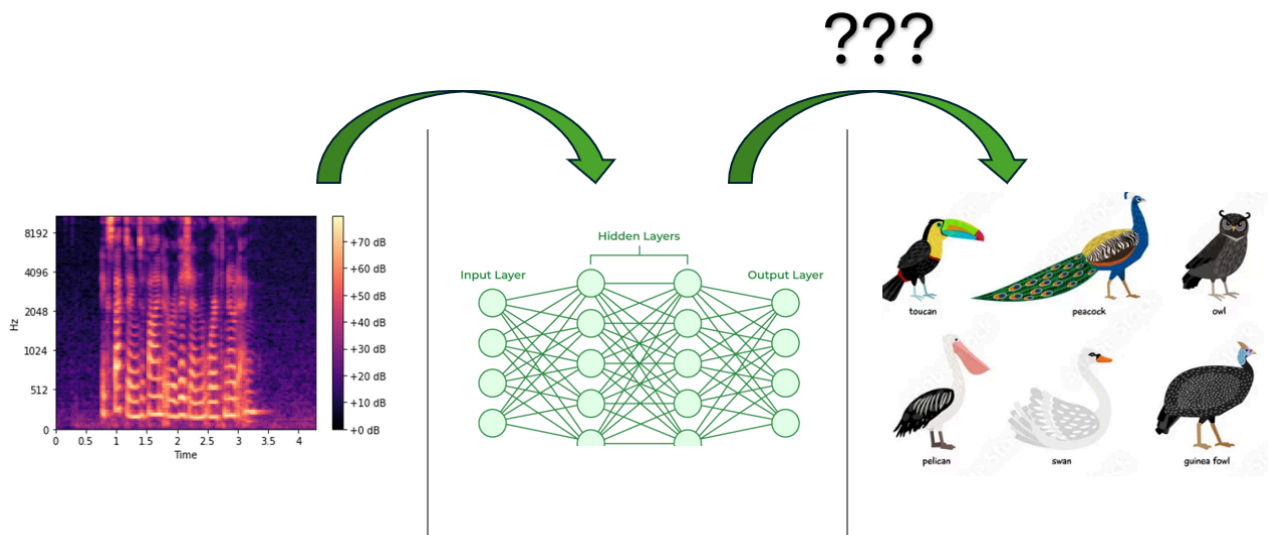# Building your first AI in Science model

Location: Michigan Data Science, 3520 Green Ct #300, Ann Arbor, MI 48105
Datetime: Friday, November 14th, 10 AM - 5 PM

Description:
Making your first neural network can be intimidating, and just looking at code and online videos isn't the same learning experience as a hands-on exercise. From 10:00 AM to 12:00 PM, we will cover the basics of tree ensemble methods for tabular data, convolutional neural networks and vision transformers for image data, and developing and publishing your model on Hugging Face. From 12 to 1 PM, we will have lunch provided. From 1:00 to 2:00 PM, MIDAS has a guest speaker presenting on data visualization. From 2 to 5 PM, we will split into groups of 2-3 to build models predicting which of 10 bird species (categorical classification) can be identified based on acoustic data and metadata. Workshop facilitators will be available to assist and advise the groups. Starter code examples and some preprocessed code will be provided to focus on modeling and make the hack-a-thon accessible to all expertise levels.

<u>Agenda:</u>

- 10 AM - 11 AM: Background on machine learning models
  - Motivating example: species classification
  - Tabular data methods
    - Random forest
    - Gradient boosting
    - Cross validation
  - Classical neural networks
    - Convolution
    - Recurrence
  - Transformers
    - Vision Transformers
    - Pretrained models
  - Example code
    - Gradient boosting
    - Convolutional neural network
    - Vision Transformer
    - Pretrained model
    - Debugging

- 11 AM - 12 PM: Iterative model development and version control
  - GitHub
  - Hugging Face
  - Training models on the Great Lakes Cluster with GPUs

- 12 PM - 1 PM: Lunch, and description of the acoustics dataset
- 12:45 PM - 2 PM: Data visualization foundations (w/ Dr. Sabine Loos)

- 2 PM - 5 PM: Model competition
  - Build a species classification model from audio data
  - Split into groups of 2 or 3
  - First hour only use APIs and tutorial code (no AI coding assistance)
  - Handout of suggestions