Introduction, Research Problem, Motivation & Goals

- **Introduction**: Farfetch is a British-Portuguese online luxury fashion store, founded in 2007, which has partnered with over 700 boutiques to sell a variety of products.
- **Research Problem**: Enhance customer satisfaction through aspects of comfort, accuracy, and fulfillment with the products.
- **Motivation**: Reduce the economic costs invested entailed in manufacturing and return rates.
- **Overall Goal**: For a given user or product, develop a model whose output can be used to recommend the product with the right size and create a web app which is model agnostic, to explore recommendations based on the user.

Data & Feature Extraction

- **Numerical variables**: converted height, weight into doubles, bust size modification
- **Categorical Variables**: used neural network embedding layer to reduce the dimensionality of the categorical features
- **Additional latent features**: used skip gram based Word2vec model to extract latent features from the user purchase history
- **Review text**: NLP methods, sentiment analysis on review relative to size - returns positive, negative, neutral, and compound score

Models & Results (Size and Fit prediction)

**Benchmarks**: Random Prediction, Average Purchase History & Linear Regression

**Average Purchase History**
- **Goal**: Predict the size of a user using their past purchase history, and their average sizes
- **Outcome**:
  - Mean Squared Error (MSE) of 6.13
  - 60% users only have one purchase, which skewed data
  - Improved MSE: 27.67

**FIGURE 1**: Visualization of the structure of our dataset enriched with latent features after dimensionality reduction into 2D space. Different colors correspond to different sizes of products.

**FIGURE 2**: Visualization depicting and comparing the performance between the various models.

**Blue**: Test accuracy without hyperparameter tuning
**Green**: Test accuracy with hyperparameter tuning
**Red**: Best accuracy: 76.29%

**FIGURE 3**: Our input webpage for the Farfetch Fit Assistant

**Web Application: Fit Assistant**

**Goal**: Explore and preview user data, to present to internal end-users at Farfetch

**INPUT**
- User ID
- Product ID

**OUTPUT**
- Product ID
- Predicted size for the product

**MySQL database**

**Backend**

**Model (via Pickle File)**

**Database tables**

**Model**

**User Information**

**Product History**

**ACKNOWLEDGEMENTS**: José Marcelino and Farfetch Corporate Partner mentors, Data Mine staff

**The Data Mine Corporate Partners Symposium 2022**