

VTEC Visualization Phase 1 Report

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Domain Situation

Problem

Virginia Tech is home to Virginia's largest and oldest entomological collection, the Virginia Tech Insect Collection (VTEC). In recent years, a project named Entomo-3D was launched with the goal of digitizing all of VTEC. The purpose of this project is to eventually allow digital access to the 15 thousand pinned insect specimens within the collection via high-resolution photos. In addition, provide 3D models of the insect specimens which users can manipulate and inspect in greater detail than possible with just a pinned specimen or image. Current funding limits the project team to only providing 3D models for 300 specimens within VTEC.

Currently, the 3D models developed by Entomo-3D lack an effective visualization that unifies them. The goal of our group is the development of a visualization that allows for efficient navigation and investigation of 3D specimen metadata. There is no network presence to show how the specimens relate to one another.

Users

Researchers: Analyze specimens, spot trends/relationships, etc.

Hobbyists: Identify a specimen they found, general interest

Educators: Educate students (i.e. give an example of how a phylum is distributed in nature)

Existing Solution / How they fall short

At this time each specimen with a 3D model has a page on which users can manipulate the model with relevant information (name, order, family, etc.) listed below. There exists no navigation or visualization in which users can interact with more than one specimen at a time. For example, should users want to see all specimens of the family Meloidae they must open all model pages and manually sort through them to find the answer?

Data Abstractions

Data Sources

The metadata for each insect specimen is stored in its own csv file. At this time only 255 out of the 300 projected 3D models are viable so 255 csv files will serve as the metadata sources. This will also include the 255 3D models with supporting model files.

Data Type(s)

The csv file of a single specimen is a table consisting of 136 rows (items) and 10 columns (attributes).

Scale

The attribute types for the items can be considered categorical and quantitative.

Semantics

Flat Table

Dataset Availability

Static

Task Abstractions

Geographical

Network points on a map. Understand geographic relations of the specimen

Network Graph

Show the basic attributes of the network such as centrality measures or degree levels to provide researchers with rich information about the network structure.

Filter

Sort specimens based on their attributes (i.e. phylum, kingdom, etc.)