Components

- Backend
  - Data format / Data base: Jonathan, Veronica
- Frontend
  - Timeline view / Filtering: Peter
  - Map view & Attributes view: Luis

Application

With our visualization, we want to make it easier to understand sparse data, sampled both in time and in space (e.g., reportings of animal sightings), originating from various sources. It is designed as a tool for comparison and correlation of different data layers. Initially, we will use datasets provided by Avian Knowledge Network:

- Data variables: species name and taxonomy, location of sighting, size of the sighted group
- In June 2008 it contained over 13,500,000 observations at more than 137,000 locations.
- The earliest records refer to January 1900.
- Database freely available and easy to import.

Clearly, the visualization of a dataset of this magnitude and variety is a difficult task. It is our goal to provide a convenient way to navigate through the dataset, allowing the users to extract meaningful information.

Especially the performance of the database caching and the drawing of the data, using the Java environment, will be crucial.

Timeline View

To answer our questions, the understanding of developments (especially movements) is essential. However, since observers usually do not identify the animals they have sighted, it can be hard to tell which trajectories they took. Bird migrations, for example, follow their paths with highly irregular speed.

Another aspect is the correlation of one species with another, as well as with other data that changes or emerges over time. Examples are stock statistics, natural disasters, laws, media interest etc.

These issues can be addressed by:

- A window around the slider to define a time interval, where all observations are aggregated and visualized in the map view in order to reveal, for example, periodically recurring effects.
- An integrated data layer controller and visualizer, which allows to set the visibility/appearance of datasets on the map or the timeline graph next to the corresponding layer controls.

Attributes View

The user will be able to select any sighting on the map. Whenever a visual element on the map or in the timeline graph has been selected, its specific attributes will be displayed.

General information about the species will be displayed by an embedded browser that will establish a connection with Wikipedia. Since the datasets we have do not have extended information about the species (pictures, predators, diet etc.).

Map View

The datasets we want to use contain geotemporal data about animal observations. Therefore, it makes sense to display such sightings on a map. Each data point in the map will represent a sighting. The user will be able to navigate through the map by panning and zooming, and we will also provide layered maps, so the user can decide which layers to watch at any given time. Political Division, Mountains and Rivers are examples of such layers.

The map together with the timeline has the task to visually connect the sightings. We plan to implement:

- Smoothly fading in and fading out over time to make connections of samples at different times more obvious.
- A density cloud can be displayed, according to a kernel with a modifiable radius around each sample.

The image sequence is a concept drawing of the time window and density cloud feature. It shows a migration process of different groups of birds. In the upper left image shows the idea of fading the observations in and out.