

The Flemish LifeWatch project

Milestone documentation: Bird migration visualization challenge for ENRAM (INBO), March 2015

Introduction

The INBO participates in the **European Network for the Radar Surveillance of Animal Movement** (ENRAM, <http://enram.eu>), an action initiated by the European Cooperation in Science and Technology (COST) in 2013. This network of radar biologists, meteorologists, and engineers from 24 countries aims to foster continental-scale remote sensing of animal migration using weather radars. One of its challenges is to visualize and summarize the resulting data in a way that is comprehensible, intuitive, and leads to new insights, which is the task of working group 3: Visualizing spatiotemporal patterns of animal movement.

Building on the success of the bird migration flow visualization (<http://enram.github.io/bird-migration-flow-visualization/viz>), which we developed during a hackathon last year, we co-organized a 3-day hackathon at the University of Amsterdam, inviting other developers to visualize these type of data in an intuitive way.

Visualization challenge

This hackathon – called the “Bird migration visualization challenge and hackathon” – was set up as a challenge and announced on February 2, 2015 at <http://enram.devpost.com/>. Via this dedicated platform, participants could register for the challenge and find all relevant information, including the rules for participating, the case study data they would have to visualize, the jury members that would evaluate the submissions, and the prizes one could win. The monetary prizes were sponsored by CartoDB. The hackathon was widely announced via social media and the personal networks of ENRAM community members.

Four participants officially registered for the hackathon: Wouter Van den Broeck and Jan Klaas Van Den Meersche (both from Erasmus Hogeschool Brussels, Belgium), Sérgio Branco (University of Minho, Portugal), and Kyle Horton (University of Oklahoma, United States) and attended the 3-day challenge (March 25-27, 2015) at the University of Amsterdam. After the kickoff meeting on the first day, they decided to collaborate as one team.

Results

On the final day of the hackathon, the team submitted and presented their work, which consisted of several visualizations (prototypes), grouped under the name **TIMAMP: Time Integrated Multi-Altitude Migration Patterns** (Figure 1). The submission was scored by the jury on four criteria as follows:

1. Submission requirements: The submission meets all requirements.
2. Accessibility: The TIMAMP visualization is ambitious: it combines speed, direction, density, altitude, and time into one visualization. Such a dense visualization is a great tool for researchers (the intended users), but will require some training on their part. There are different ideas on how to improve the visualization, but solutions will have to be discovered through trial and error, in collaboration with the researchers.
3. Functionality: The visualization is rendered fast and automatically from the case study data.
4. Applicability: The visualization(s) immediately sparked new ideas and has a lot of potential. It would also be applicable on a large scale.

The team was granted the monetary prize and a chance for further collaboration.

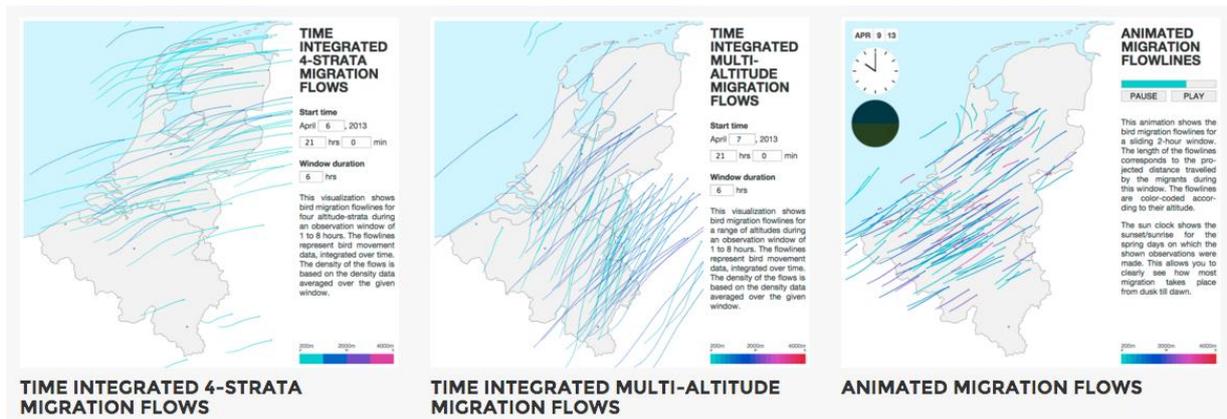


Figure 1 – Three interactive visualizations of TIMAMP, the winning submission of the bird migration visualization challenge & hackathon, available at <http://timamp.github.io/>.

Conclusion

Although we had hoped to attract more eligible participants, the bird migration visualization challenge and hackathon was a success: it resulted in a new, useful visualization and the incorporation of new developers into the ENRAM network. The hackathon has sparked a continuing collaboration between the developers of TIMAMP, ENRAM members (including LifeWatch INBO) and researchers from the US. We further developed the visualizations at a 5-day workshop and hackathon at the University of Amsterdam in June 2015 and are planning to submit a joint paper on bird migration visualizations in 2016.