



# Summer School

## Georeferenced genetic data and their evaluation

### Preliminary Program

Faculty of Forestry, Technical University, Zvolen, Slovakia, September 08-11, 2014.

#### Instructors:

- Dušan Gömöry, Technical University, Zvolen, Slovakia
- Ladislav Paule, Technical University, Zvolen, Slovakia
- Ján Tuček, Technical University, Zvolen, Slovakia
- Milan Koreň, Technical University, Zvolen, Slovakia
- Josef Bryja, Institute of Vertebrate Biology, Czech Academy of Sciences, Brno, Czech Republic

**Location:** Lectures and practical exercises will be held in the main building of the Technical University

**Registration:** To register send an email to [paule@tuzvo.sk](mailto:paule@tuzvo.sk) before July 1, 2014. The course is for participants from EvoTree members free of charge.

**Topic:** Evolution always occurs in time and space. Due to a variety of processes, genes and genotypes are non-randomly distributed in space. The course will provide a short information on these mechanisms, their outcomes, as well as methodologies how spatial patterns can be assessed. Processes such as isolation by distance, colonization, local adaptation or introgression will be addressed. Further we will continue with spatial patterns in genetic data, produced by these processes (point processes, spatial autocorrelation for discrete and continuous data). We will provide basic information on the methods of geostatistics and geographic information systems. Finally, the framework of landscape genetics as an autonomous field of population genetics will be explained.

**Credits:** 2 ECTS

# Preliminary Program

## Sunday, September 7, 2014

Arrival of participants  
Accommodation

## Monday, September 8, 2014

- 08:30 Welcome address – *Prof. Dr. Rudolf Kropil, Rector*  
Welcome address – *Prof. Dr. Ladislav Paule*  
*Coffee break*
- 09:00–09:45 Landscape genetics – what is spatial structure? Trends, patterns  
09:45–10:30 Biological mechanisms leading to spatial and geographic structure at the population level and at the regional level (isolation by distance, colonization, local adaptation, hybrid zones)  
*Coffee break*
- 10:45–11:30 Spatial patterns in genetic data (point processes, spatial autocorrelation for discrete and continuous data)
- 11:30–12:15 Basics of geostatistics (variogram, correlogram, kriging)
- 12.30–13:30 *Lunch*
- 13:30–15:00 Software practicals – geostatistics
- 15:00–16:30 Software – landscape genetics

## Tuesday, September 9, 2014

- 09:00–09:45 Spatial aspects of field experiment evaluation  
09:45–10:30 Space, location and metrics  
Space concepts and modeling, positioning, reference system, metrics, distance  
*Coffee break*
- 10:45–11:30 Space, location and metrics (continued)
- 11:30–12:15 Distance concepts and analyses  
Different concepts of distance – Euclidean, manhattan, ground, spheric, cost(friction)
- 12.30–13:30 *Lunch*
- 13:30–15:00 Software practicals – geostatistics
- 15:00–16:30 Software – landscape genetics

## Wednesday, September 10, 2014

- 08:00–09:45 Distance analyses – Thiessen polygons, location and allocation, buffering, network analyses  
Modelling and application aspects
- 09:45–10:30 Case studies – trees  
*Coffee break*

10:45–11:30 Case studies – trees  
11:30–12:15 Case studies – animals  
12.30–13:30 *Lunch*  
13:30–17:00 Field trip

**Thursday, September 11, 2014**

08:30–10:30 Presentations of participants  
*Coffee break*  
10:45–12:00 Final discussion  
12:00–13:00 Evaluation of summer school  
13:30–14:00 *Lunch*  
14:00– Departure of participants