

# Monitoring of dynamic deformations and vibrations with LiDAR

## Background and state-of-the-art

- Vibrations of large structures are most times measured using accelerometers, GNSS, tilt sensors, etc., at multiple positions
- LiDAR can only be used to determine oscillations along a profile due the low repetition rate of a 3D scene
- Connections to Operational Modal analysis (OMA) and Stochastic Subspace Identification (SSI) for structural health monitoring

## Research questions

- Can LiDAR be used to monitor vibration behaviour in three dimensions?
- Are there methods to process continuous LiDAR data in time and space?
- Can low cost sensors contribute to LiDAR vibration monitoring?

## Research methods

- Spectral analysis of signals
- Parameterization of harmonic oscillations w.r.t. the local neighborhood
- Adjustment theory as Kalman-filtering, etc.

