Detecting Migrating Birds at Night

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Goal
Automatic bird detection from stereo sequences

Method

- **Foreground detection**
  - Background subtraction

- **Geometry verification**
  - RANSAC with stereo vision constraints

- **Trajectory verification**
  - Integrating along hypothesized bird trajectory
  - Handling uncertainty using generalized distance transform

Existing Solutions
- Satellite tracking $\rightarrow$ expensive
- Weather radar $\rightarrow$ indirect/inaccurate
- Moon watching $\rightarrow$ labor-intensive

Challenges
- Small targets
- Unknown trajectory
- Very low SNR

Data collection
- Near IR VGA momo camera x2
- Two meters baseline
- Spring migration
- 20 mins

Evaluation

Statistics

- Orientation: Mostly heading North
- Altitude: 400 – 1200 meters
- Speed: 15 – 30 meters/s