

# Structure-from-Motion and Dense Image Matching

— *The Perfect Love in Photogrammetry*



October 7.-8.2014 Otaniemi, Finland

Tuesday Oct 7.

Lecture hall A2, [Otakaari 1](#) (Main building)

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|---------------|--|
| 8:30 - 9:30   | Session I, Introduction „Structure-from-Motion and Dense Image Matching – A Perfect Couple“ (Fritsch 30 min, Frahm 30 min)                               |
| 9:30 - 10:00  | Break  |
| 10:00 - 10:45 | Session II, Math Definitions: Perspective versus Projective Geometry (Fritsch 23 min, Frahm 23 min)  |
| 10:45 - 11:30 | Feature Detectors (SIFT, ASIFT, SURF, ORB, etc) (Frahm 45min)  |
| 11:30 - 11:45 | Break  |
| 11:45 - 12:40 | Session III, Direct and indirect methods of spatial resection (Fritsch, 20 min) Basics of Bundle Block Adjustment and Self-Calibration (Fritsch, 45 min) |
| 12:40 - 13:40 | Lunch break  |
| 13:40 - 14:30 | Structure-from-Motion Technologies: Definitions, workflows, programs. (Frahm 25min, Fritsch 25 min)  |
| 14:30 - 15:00 | Break  |
| 15:00 - 16:00 | The stereo case (Frahm, 60mins)  |

Wednesday Oct 8.

Lecture hall OIH, [Otaniementie 19-21](#) (Open Innovation House)

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| 8:30 - 10:00  | Session I, Image matching, dense image matching – Area-based image matching, feature-based image matching, Semi-Global Image Matching, etc (Fritsch, 90 mins) |
| 10:00 - 10:15 | Break   |
| 10:15 - 11:00 | Session II, Image based localization (Frahm, 45 min)  |
| 11:00 - 11:30 | Break   |
| 11:30 - 12:15 | Session III, Applications of Sfm and DIM (Fritsch, 45mins)  |
| 12:15 - 13:15 | Lunch break   |
| 13:15 - 14:05 | Exercises: Android Sfm, DIM (Fritsch, 25 mins) Exercises DIP7 – Low cost point cloud generation (Fritsch, 25 mins)  |
| 14:30 - 15:00 | Break   |
| 15:00 - 16:00 | Two view image registration (Frahm, 60 min)   |
| 16:00 - 16:30 | Closing Discussion (Fritsch, Frahm)   |