## Nokia 2013 - Master Thesis Proposals

Nokia (in Lund) will for the fall of 2013 sponsor one Master thesis project within one of the following areas.

(Note that the final scope of each thesis proposal is open for discussion.)

### 1. Structure from motion

[Computer vision]

Investigate and implement solution for recovering the 3D structure of a scene, based on input from a brief video sequence captured with a moving (mobile phone) camera.

### 2. Object-ground segmentation

[Computer vision]

Investigate how information from multiple cues (e.g. luminance, color, texture, motion, disparity, saliency etc.) could be combined to improve object/ground segmentation.

### 3. Combined optimal seams and image transformation for image mosaics

[Computer graphics, Image processing]

When combining several images into one image mosaic, such as a panoramic image, a typical algorithm is to first find the best transformation/alignment between the stitched images, and then find an optimal seam that separates the two images optimally. The problem with this method is that sometimes it is impossible to find a transformation that models the actual change of view between the stitched images. The aim of this Master thesis is to explore alternative approaches to this task.

### 4. Real-time video stabilization

[Computer vision, Computer graphics] – Good programming skills required

Use all available resources on a mobile device (GPU, CPU, SIMD instructions, etc.) to implement a real-time video stabilizer.

### 5. Real-time video effects

[Computer graphics] – Good programming skills required

Video capturing on mobile devices has been focused on capturing natural looking videos. To add fun or other effects into the video, some form of post-processing on a different device is typically used. This master thesis aims at implementing effects that can be performed real-time, while the video is being captured, giving instant feedback to the photographer. Some example effects could be: Particle effects such as Light saber effects, fairy dust from specular reflections, burning objects, smoking objects. Sticky labels using real-time point tracking.

Applications should be sent (with “Master thesis – 2013 S2” in subject header) to: jens.mansson (at) nokia.com

Your application should include: 1) CV, 2) latest grade report and/or transcript of finished courses, 3) a short presentation of you are, and (optionally) 4) a more detailed proposal of any of the above rough suggestions.