1 Background

Codemill\textsuperscript{1} is a consultant company that started in 2007 and today has over 30 employees and offices in Umeå and Stockholm. One of Codemill’s focus areas is media production with the british newspaper The Guardian as one high-profile customer. A recent project is Video publication for eCommerce, described below.

1.1 Video publication for eCommerce

The project aims to develop an easy-to-use system to produce and publish interactive product videos online. The intended user is a shopkeeper that both has a physical and a digital shop, and who want to keep the latter up-to-date with relevant product material, such as a video blog where a great combinations of trousers and blouses are shown. The user would rig 1–2 video cameras and record a film in which some products are shown. The user should be able to annotate the products in the video with links to more information. Specifically, this means that he or she creates a 3D point cloud by clicking on the product in one or more frames, and the system then uses some form of object tracking or object recognition to follow the object and generate a polygonal frame in the rest of the video. The information is stored as metadata. To support the work flow it is also necessary to show which parts of the film has been chosen, by e.g. making these regions brighter or by drawing a border.

2 Task

Your task is to develop and evaluate algorithms for object detection and tracking in video streams.\textsuperscript{2} The “producer” user should be able to annotate the video by select areas where the object in question is seen. The system should detect where the object is in other images and present that information to the producer, e.g. by a bounding polygon. The producer should be able to modify the suggested polygons interactively. Furthermore, it should be possible to apply “interesting” filters, e.g. with “glow” effect to the selected regions. The producer should be able to attach multiple annotations to the same video, one for each object. Each annotation should be associated with an URL. The “viewer” of the video should be able to click on an annotated area and be re-directed to the corresponding URL.

3 Data

Some test videos may be supplied by Codemill. However, the team should create a test area where videos and/or image sequences are recorded by the team.

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\textsuperscript{1}www.codemill.se

\textsuperscript{2}Image sequences may be an alternative.
4 Expected results and delivery

The expected result includes:

- The application code, well documented.
- Evaluations of selected algorithms for detection, classification and tracking.
- Descriptions of the algorithms. This includes algorithms that were deemed interesting but were not evaluated due to lack of time.
- A suggestion on what algorithms to use, including motivation.
- Instructions for how to use the application.
- Instructions on how to extend the application with new algorithms.

The delivery should be approved on June 5th, 2015.

5 Operation

As clients, we expect full transparency of the work and want a method of operation that includes continuous feedback. It is especially important that we can participate and guide the work in whatever direction we believe to be most valuable to us.

6 Resources and costs

We have allocated approx 2000 hours for this task. We intend to buy this as a fixed price order with a delivery guarantee, i.e. that you undertake to deliver with the requested result.