

# The biggest sofa that fits in my car trunk!

## Background

In both academic and industrial circles a fundamentally important problem has been neglected so far. The problem is to find the largest volume object that can be moved between two places. A solution to this problem could not only produce a scientific breakthrough but also save industry millions of SEK because it allows design problems to be detected earlier in the design phase. To address this problem, Fraunhofer-Chalmers Centre (FCC) is currently offering a master thesis position entitled “Largest volume path planning”. The goal of the thesis is to build on and implement some of the ideas presented in [1].



## Task

- Implement the ellipsoid volume increasing algorithm presented in [1] with an initial focus on 2D and later, if time permits, on 3D.
- If time permits look at the other steps presented in [1].
- Examine other approaches to the problem and assess their strengths and weaknesses relative to the approach in [1].

## Goal

- To produce code (C++, Matlab, etc.) that can carry out the required task.
- To publish a scientific paper on the results at a suitable conference.
- Compare the results presented in [1] with other approaches.

## Means & Conduction

Office, computer and software will be arranged by FCC.

## Information

### Contact and Supervisor

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[1] *E. Shellshear, R. Bohlin* “A Heuristic Framework for Path Planning the Largest Volume Object from a Start to Goal Configuration”, ICINCO, 2014