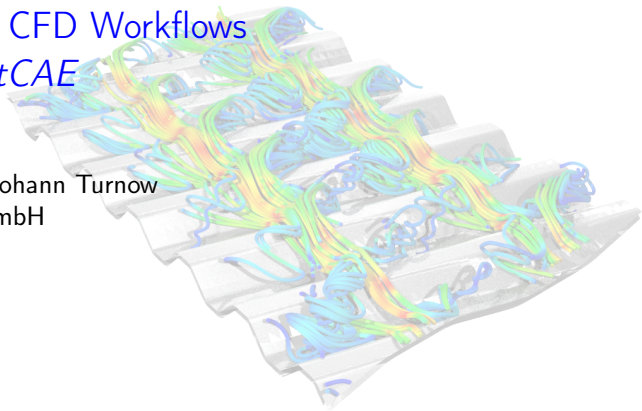


# silentdynamics

Automated CFD Workflows  
with *InsightCAE*

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## Software package for engineering analysis (CFD, FEM)

- ▶ simple and quick setup of analysis
- ▶ avoid errors in (OpenFOAM) setup
- ▶ quick repetition of analysis after geometry or BC change  
⇒ prerequisite for optimization
- ▶ quick and reliable documentation of results
- ▶ Flexibility
- ▶ Customisation



Can we achieve efficient workflows using OpenSource Software for complex analysis?

- ▶ Yes it is possible, because:
  - ▶ OSS has an open architecture with many possibilities for automation
  - ▶ Many independent software tools for similar tasks are available but with different strengths and weaknesses
  - ▶ Need to combine and support multiple tools
  - ▶ One quickly ends up in complicated workflows
  - ▶ ⇒Automation can hide complexity of the workflow

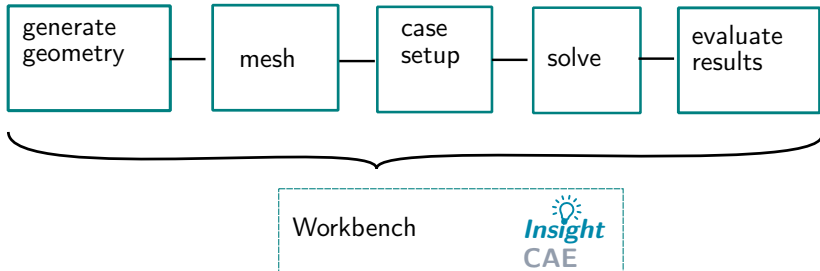
## What is the idea/aim of “InsightCAE”?

- ▶ Conduct an “analysis” as much automated as possible



- ▶ Take a minimum of necessary parameters which need to be changed
- ▶ Standardization / best practice / testsuites for a given analysis/task
- ▶ Bundle addons, extensions and interfaces for all required external software utilities
- ▶ Automatic computation of many variants
- ▶ Fast case building
- ▶ Deployment: Provide one installation package for all workflow-related software components
- ▶ `sudo apt install insightcae-base`

## Workflow steps as analysis module





InsightCAE provides:

- ▶ Defined input parameters for simulation
- ▶ GUI for parameter editing  
⇒ helpful for unexperienced users

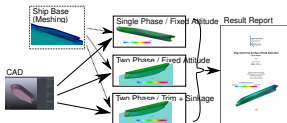
Motivation

simple generic analyses for validation

- ▶ channel flow 
- ▶ flat plate 
- ▶ 2D airfoil 
- ▶ ...

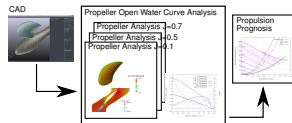
CFD of ship resistance

- ▶ single phase
- ▶ two phase fixed
- ▶ two phase with trim and sinkage



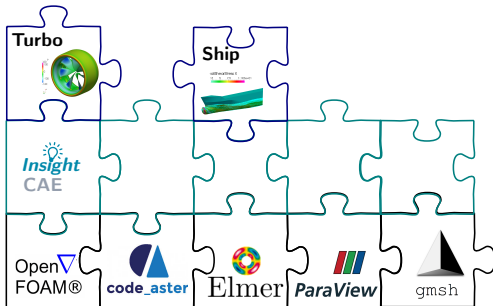
propeller and turbomachinery analyses

- ▶ free propeller
- ▶ ducted propeller
- ▶ axial pump
- ▶ optimal diameter, optimal rpm, propulsion prognosis



## Summary

- ▶ Efficient and automated computations using insightCAE
- ▶ InsightCAE connects different OSS using predefined interfaces
- ▶ Standardized simulations / reducing of time consuming user mistakes
- ▶ Quality is ensured
- ▶ Fast workflow!



Thank you very much!

silentdynamics GmbH

<http://silentdynamics.de>

```
$ sudo add-apt-repository http://downloads.silentdynamics.de/ubuntu
$ sudo apt-key adv -recv-key -keyserver keys.gnupg.net 79F5CBA4
$ sudo apt-get update
$ sudo apt-get install insightcae-base
```