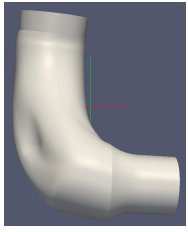
My main research interests are shape/topology optimization, fluid mechanics, and turbulence.

- **Optimal shape design of . . .**



. . . *air ducts* . . .

. . . in *combustion engines*.

Determine an *optimal shape*, by *shape/topology optimization*, of a region interested to minimize a number of suitable objectives subject to fluid flow [*fluid mechanics* (fluid dynamics, CFDs), *turbulence models*] via (discrete/*continuous*) *adjoint-based* approaches for many *optimal design problems* in *engineering* or *biomedical sciences*.

- **Fluid mechanics ▷ Fluid dynamics/CFDs**
  - Incompressible viscous *Navier-Stokes equations* with *mixed boundary conditions*
  - STAR-CCM+, OpenFOAM
- **Turbulence models ▷**
  - LES ▷ [Spalart-Allmaras, *Smagorinsky*]
  - RANS ▷ k-ϵ □