Seminar class

Turbomachinery and Optimization Technique

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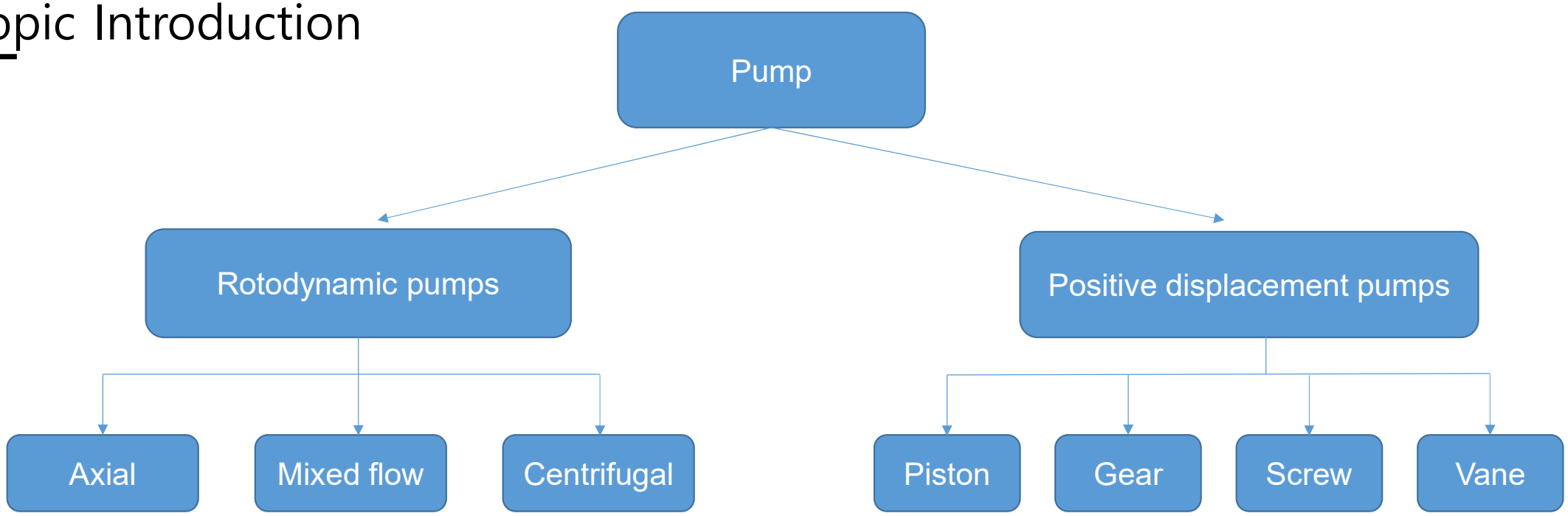
Campus: **Korea Institute of Industrial Technology (KITECH)**

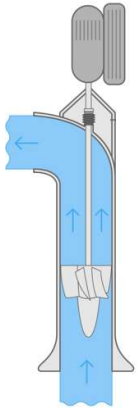
Advisor: **Prof. Jin-Hyuk Kim**

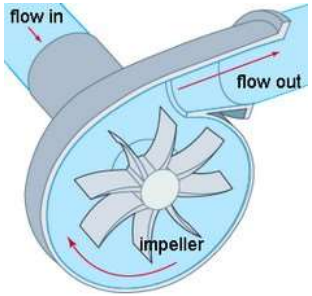
Contents

Topic Introduction

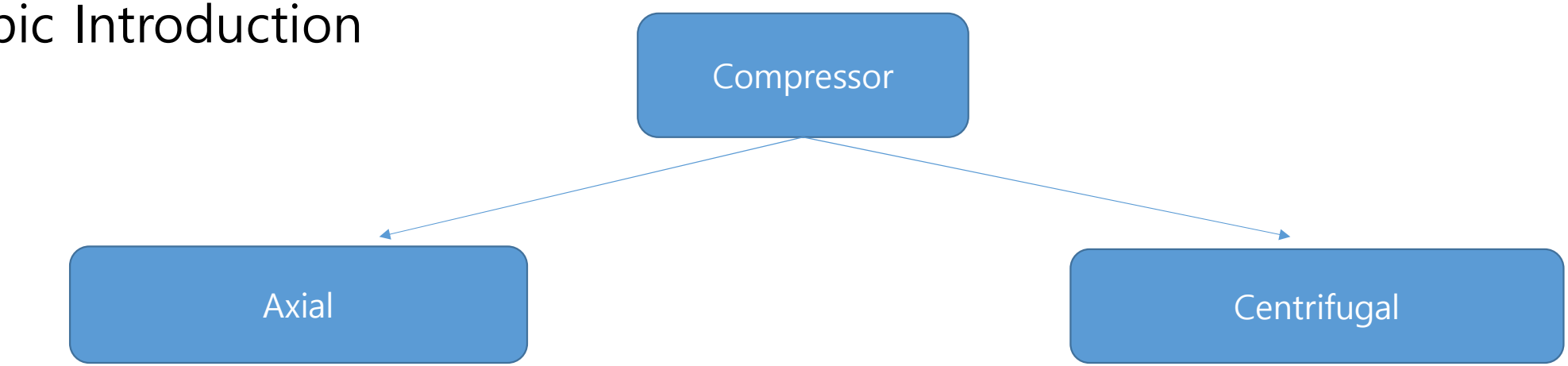
Topic Introduction

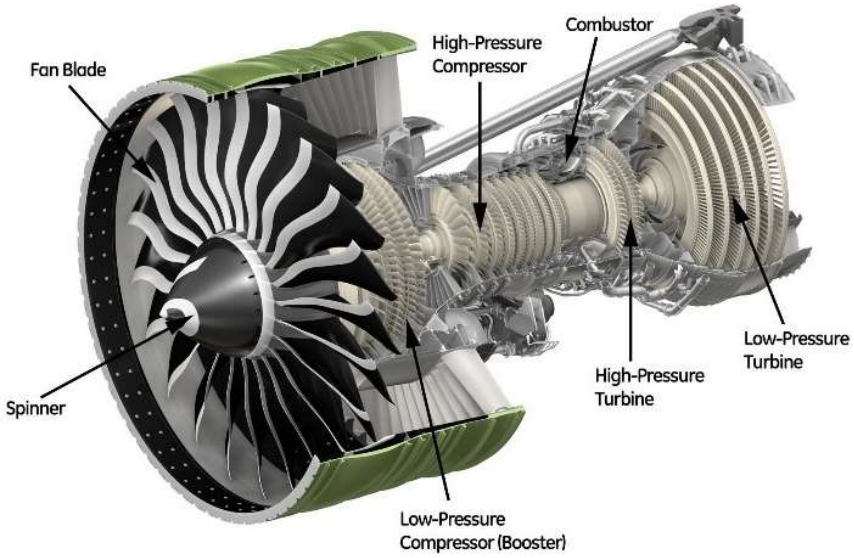


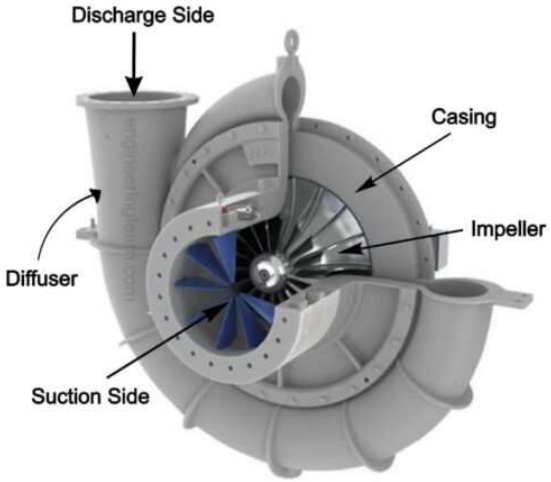


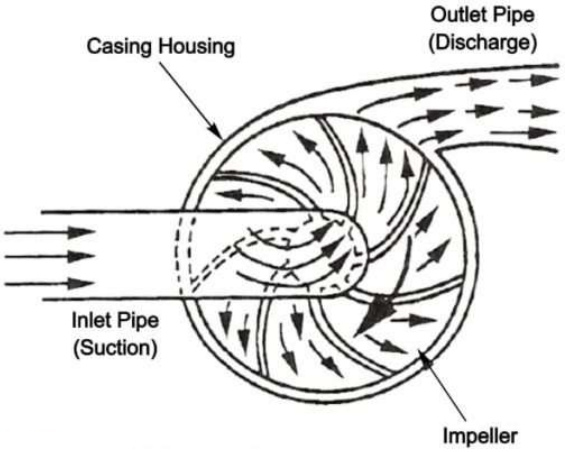


Topic Introduction



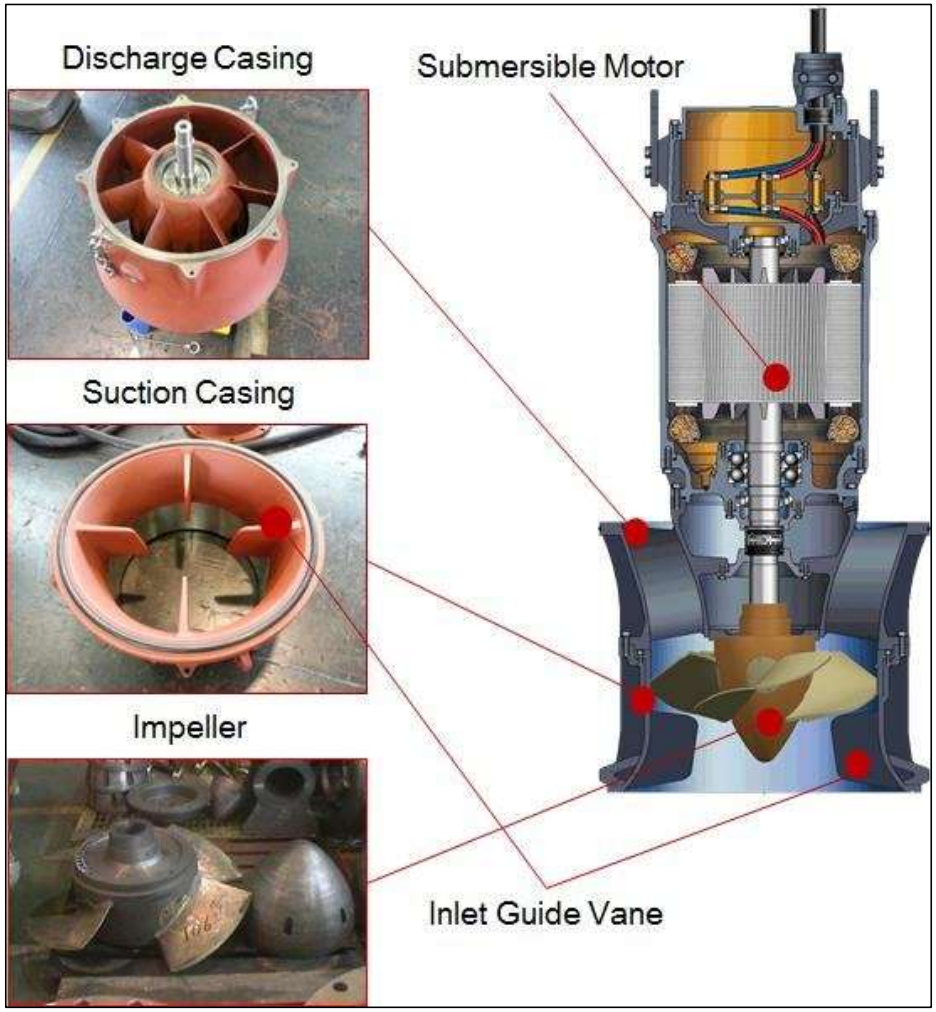






Axial Flow Pump

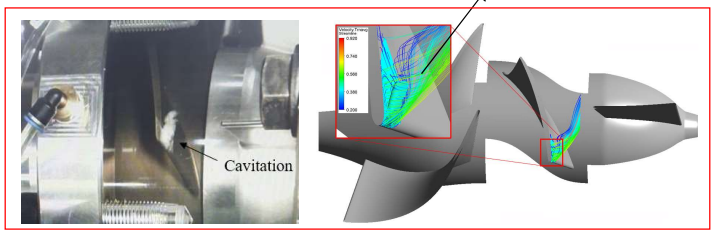
➢ Structure

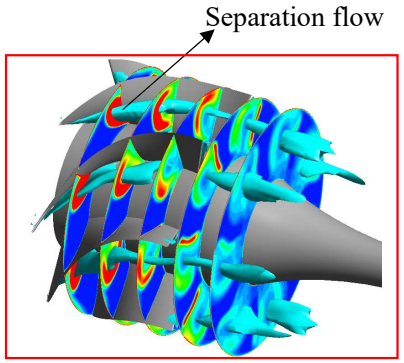


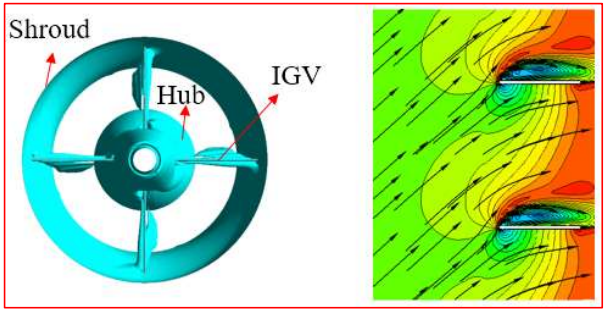
➢ Application

➢ Weakness

- Cavitation, separation flow, trailing edge vortex, pre-swirl, noise, and vibration, etc.







Centrifugal Pump

❑ Centrifugal Pump

- **Problems with clogging**

✓ Decreasing the pump efficiency

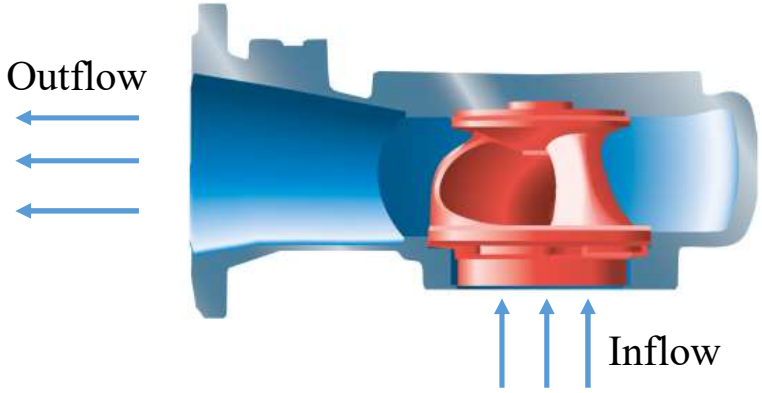
✓ Motor overload

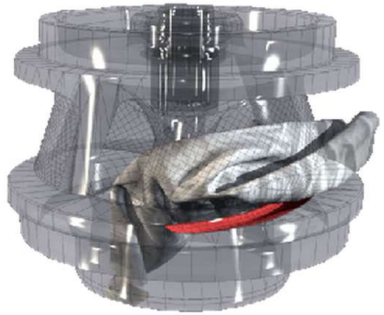
✓ Impeller abrasion

✓ Pump damage

- **How can we do to prevent clogging problem in pump?**

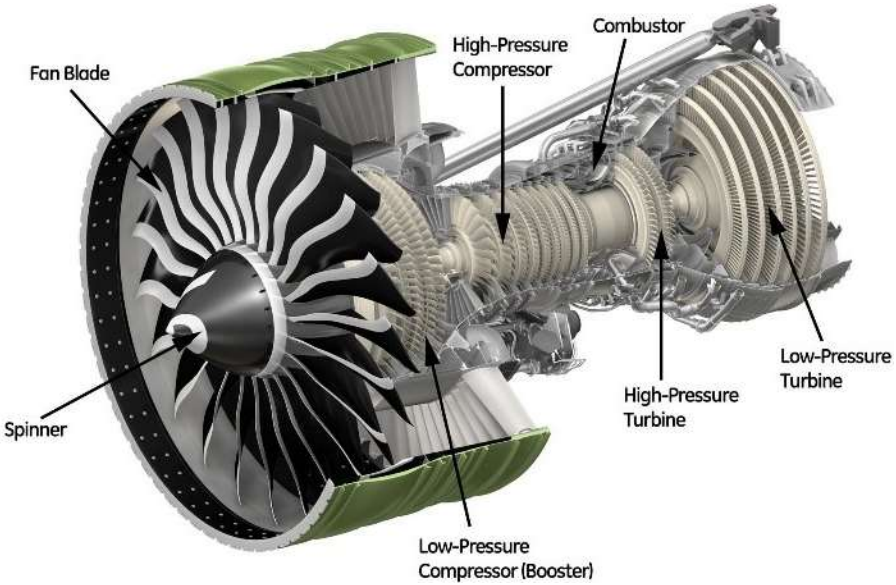
➡ Single-channel Pump





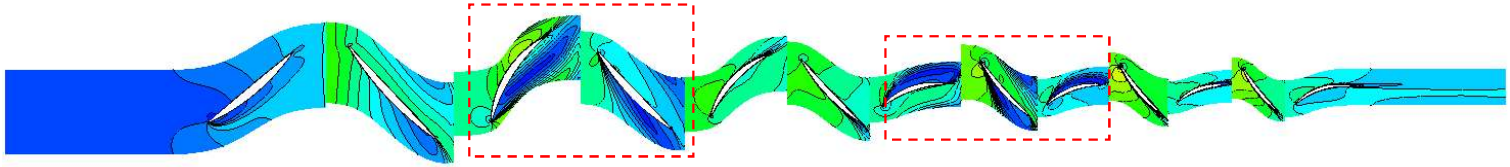
Axial compressor

- Structure



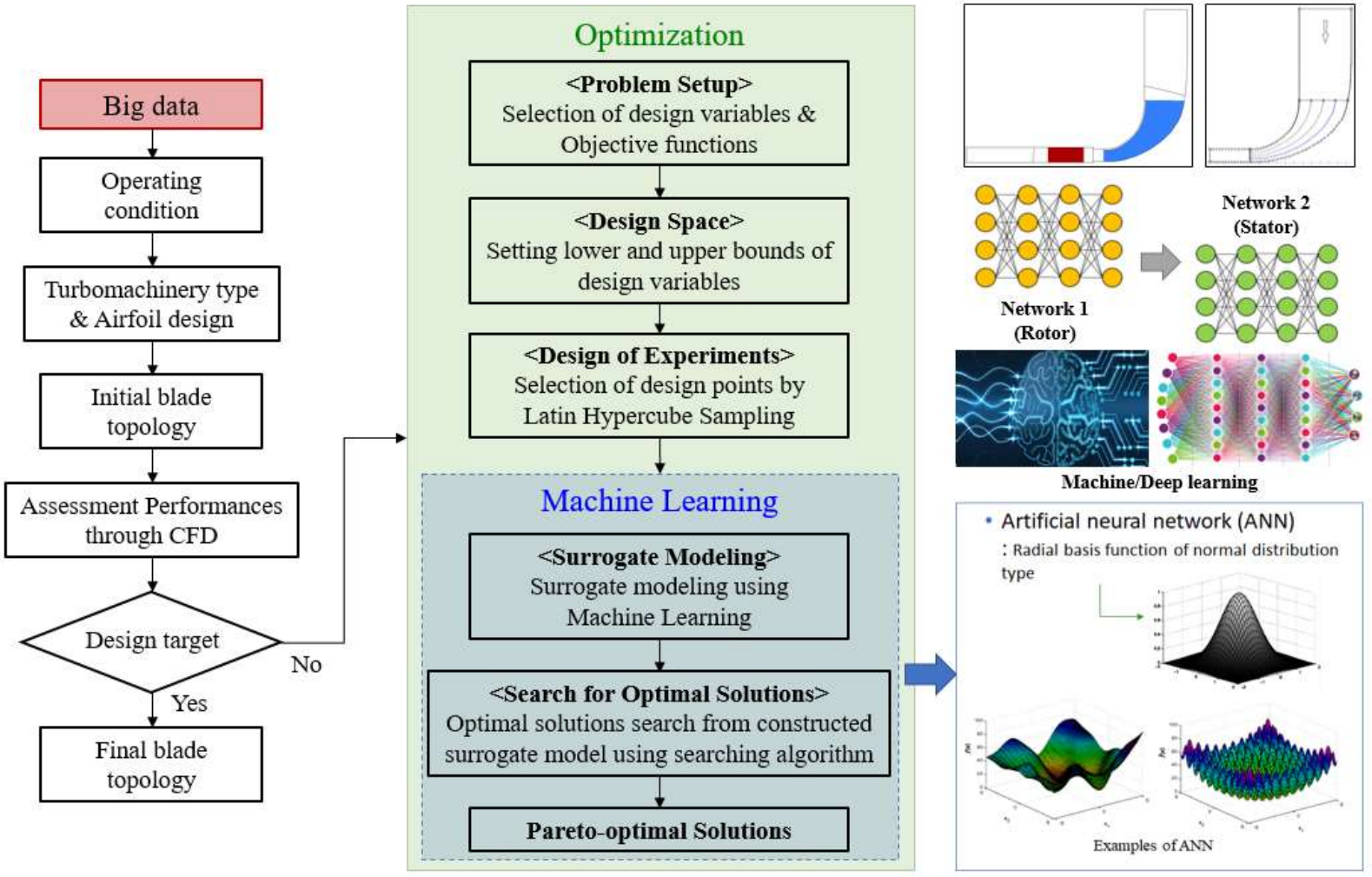
- Weakness

Flow Separation



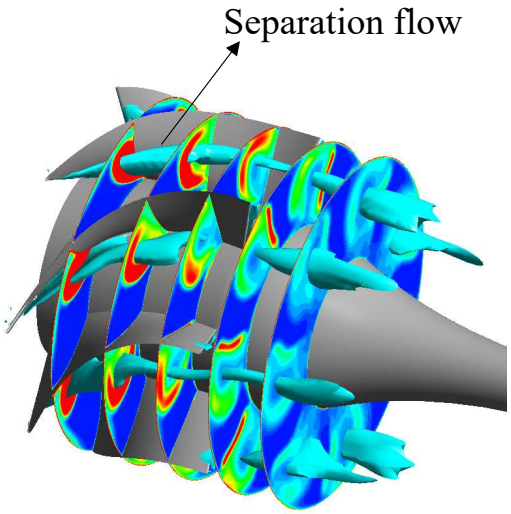
Turbulence

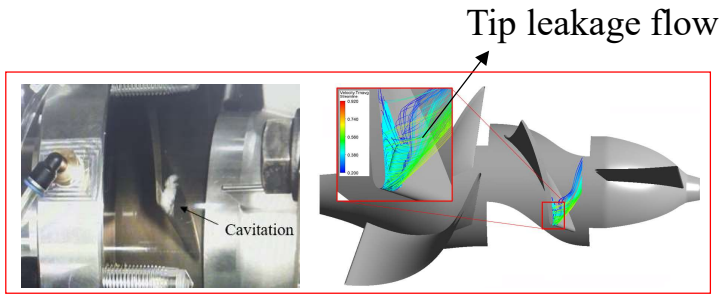
Research Process

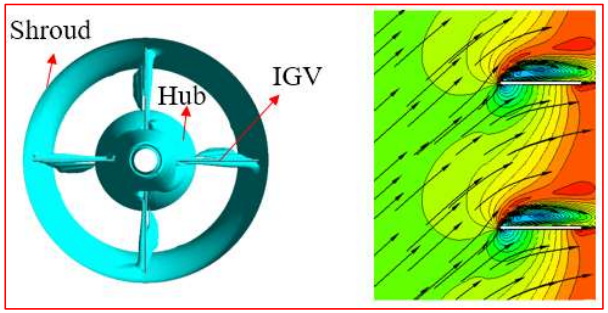


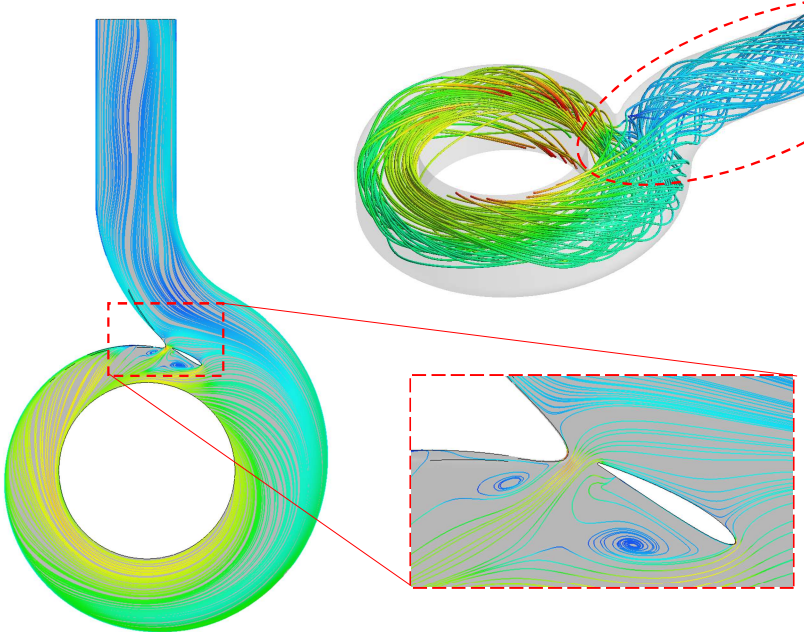
Why optimization? Motivation!

- Bad phenomena



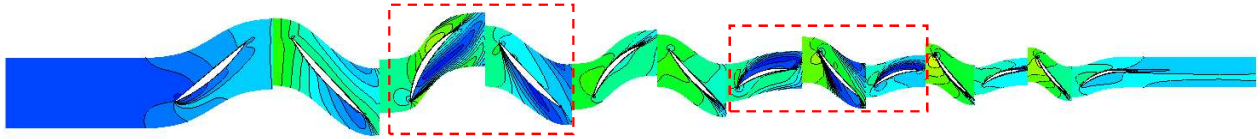






Improving Performance!

Flow Separation

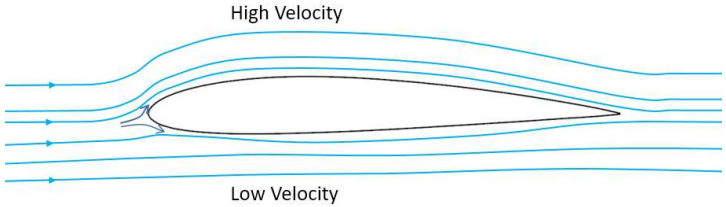


Turbulence

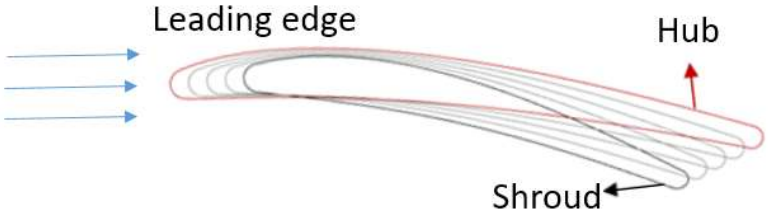
Related studies – Axial Flow Pump

1. IGV profile

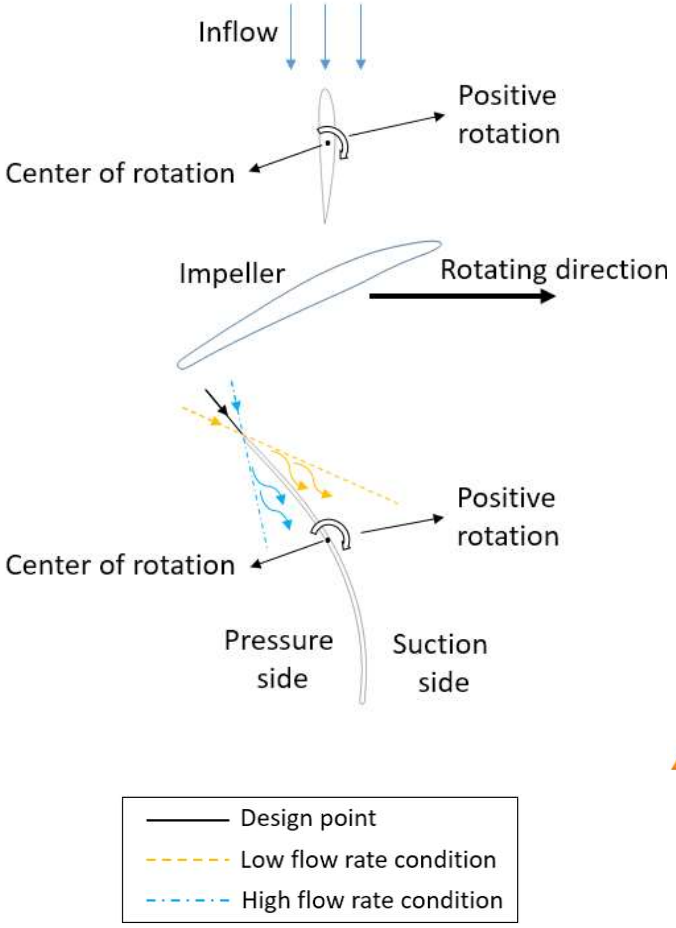
(a) Normal profile



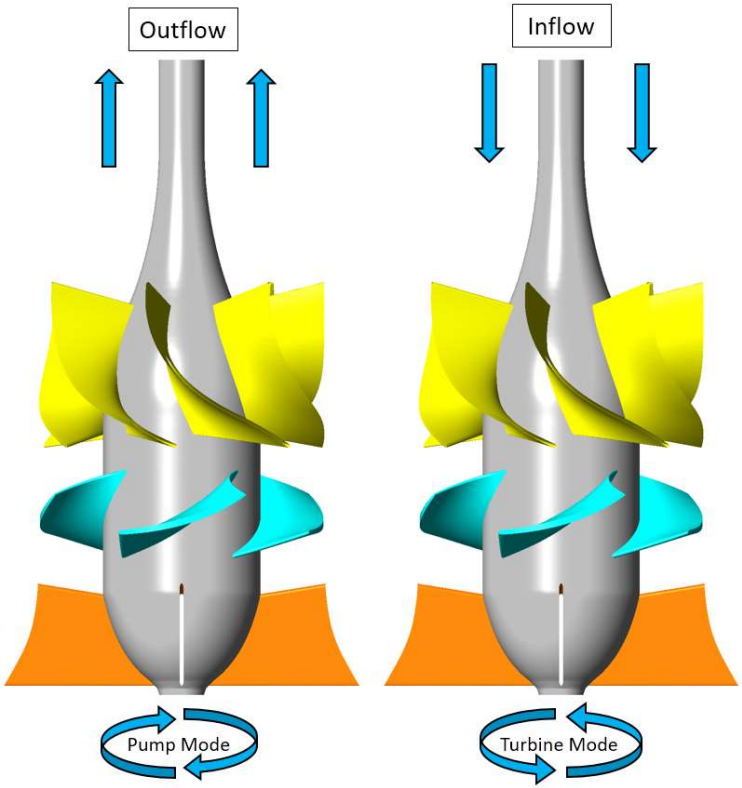
(b) NACA profile



2. Adjustable IGV and DV

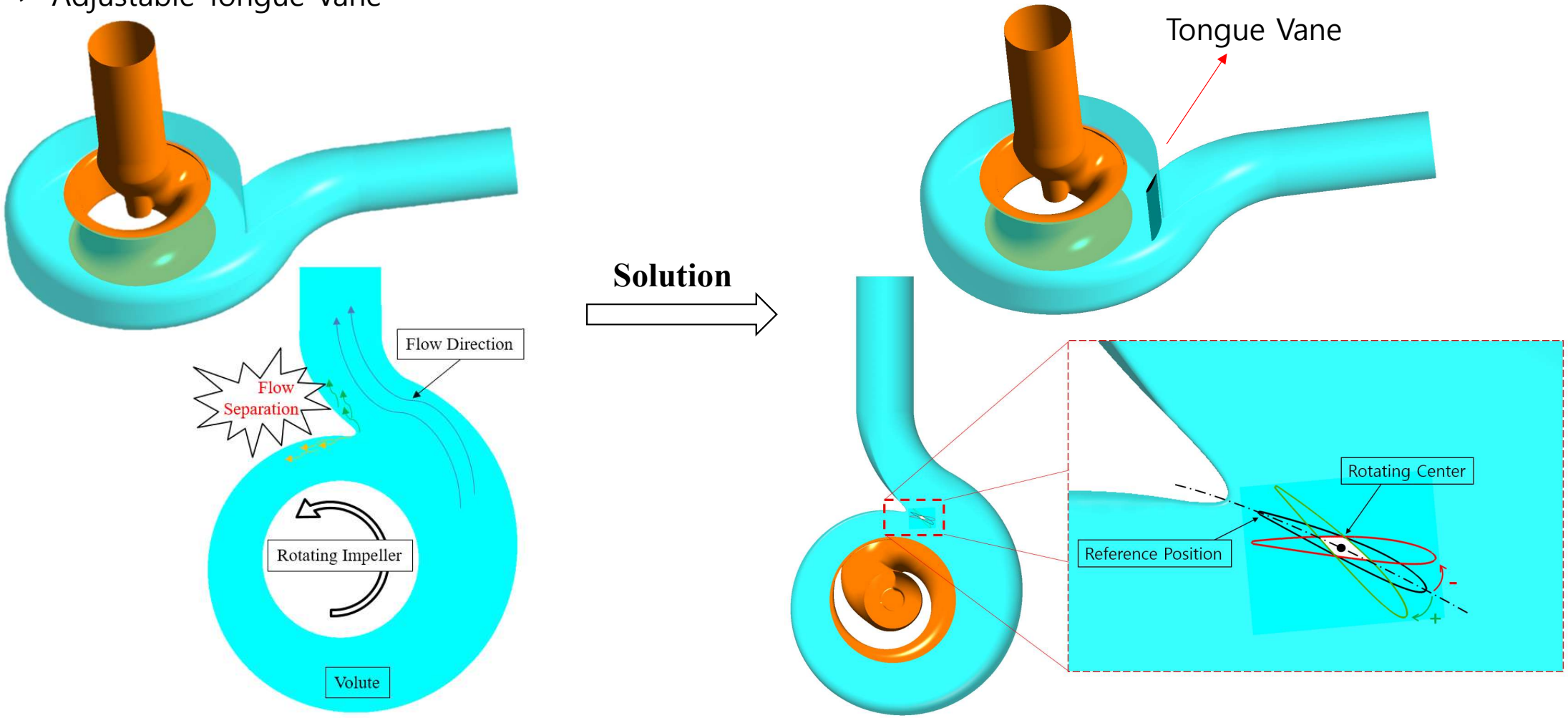


3. Pump as Turbine



Related studies – Single Channel Pump

✓ Adjustable Tongue Vane



Thank You For Liste ning!