Master Thesis Proposals

POLITECNICO
MILANO 1863

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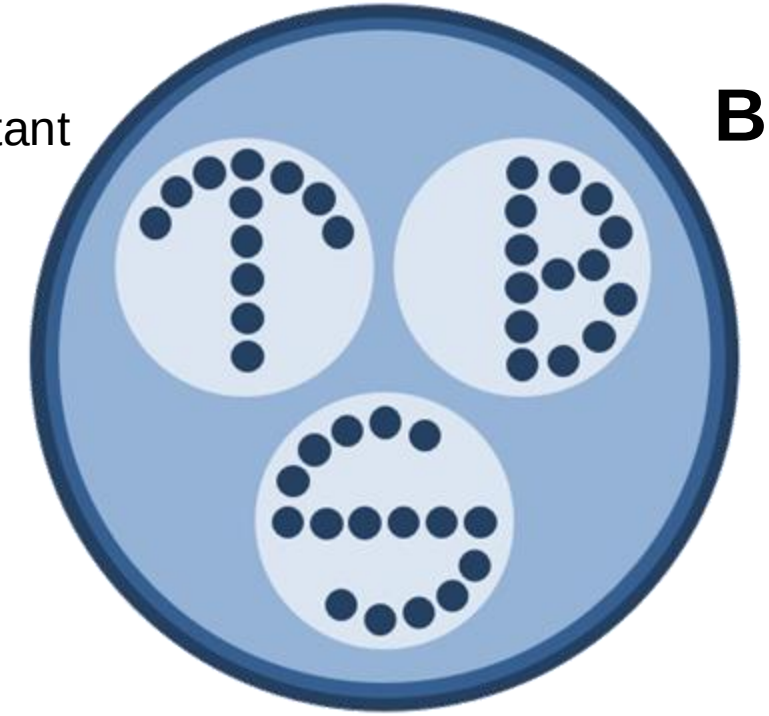
Project TBS

Torsion-resistant



Bio-inspired

Structures

PERIOD ABROAD

POLITECNICO MILANO 1863

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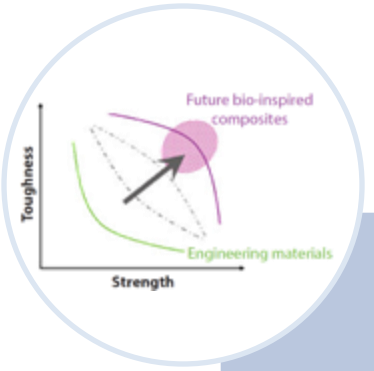
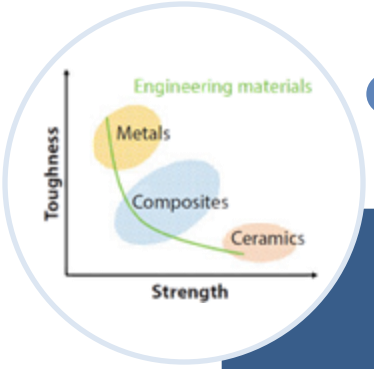
Project 2: TBS Problem definition

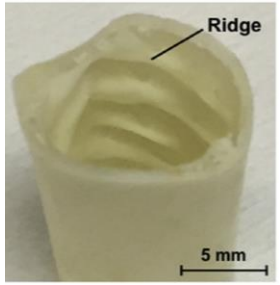


… to future bio-inspired composites…



From traditional materials…

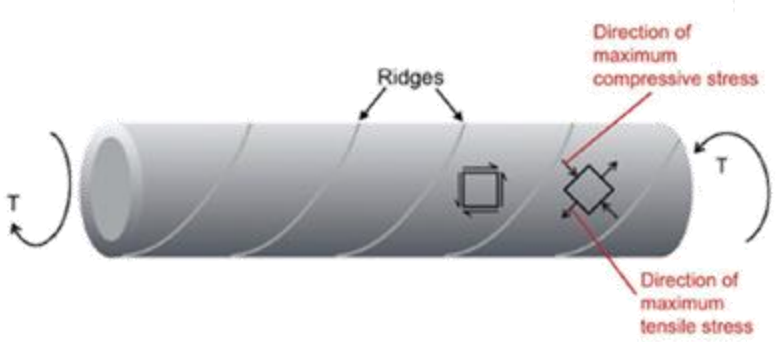
Project 2: TBS Problem definition



Ridges

Ridges: torsion resistance

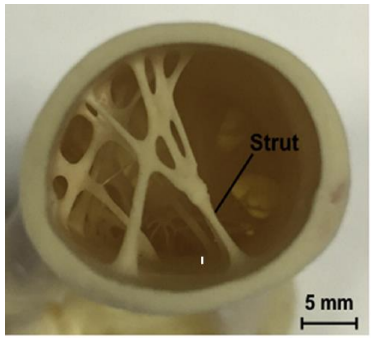
Protrusions of bone. In avian bone they generally develop at – 45 °to the horizontal axis of the bone



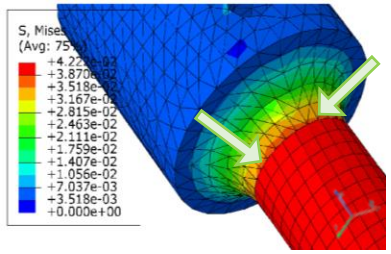
Struts: bending resistance

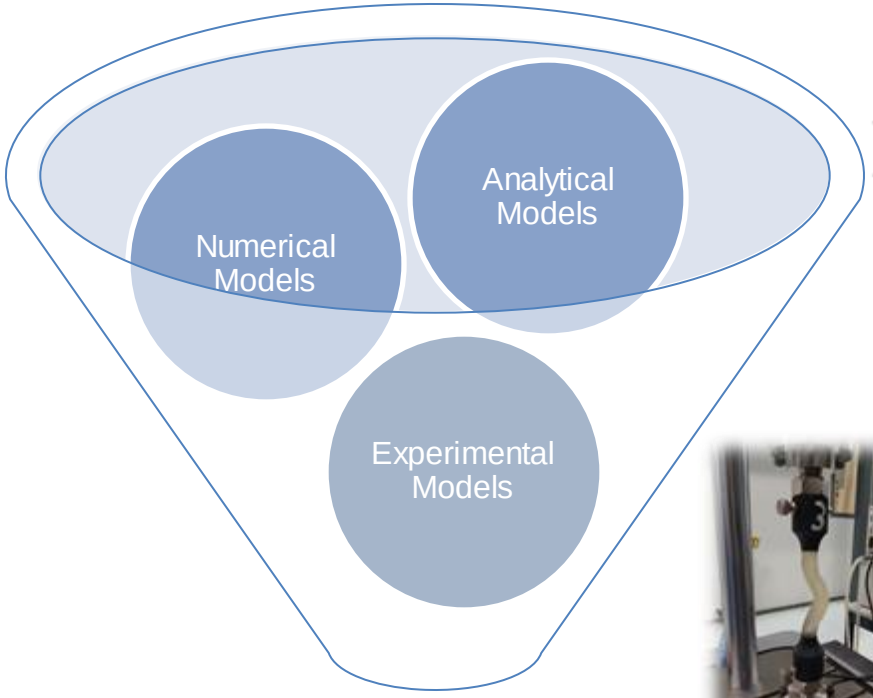
Isolated rods that stretch across the interior of pneumatic bone. They are found on the ventral side of wing bones at locations that have a higher risk of local buckling due to combined bending and torsion loading.

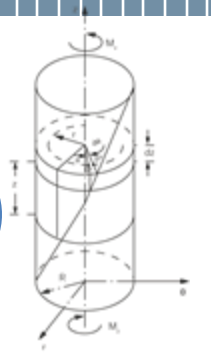
Struts



Project 2: TBS Aim of the study







Taylored torsion-resistant behaviour

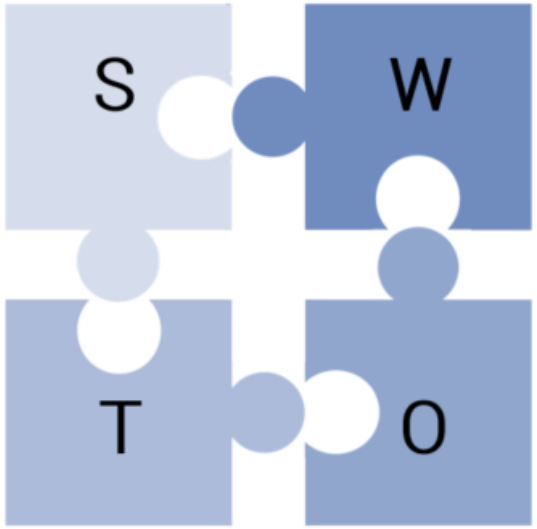
Project 2: TBS SWOT Analysis

STRENGHTS

- Osteonic structure → torsion-resistant properties

WEAKNESSES

- Low resolution of the 3D printer



THREATS

- Difficulty in realizing complex hierarchical structures

OPPORTUNITIES

- Taylored torsion-resistant structures design