



Mounib Tlaidi

Thèse (ANR AVATARS, 2023 – 26)
Gipsa-lab (N. Henrich Bernardoni)
3SR (L. Bailly)

Caractérisation du comportement vocal humain sur banc mécatronique robotisé

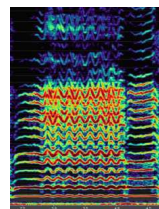
Characterization of human vocal behavior using a robotic mechatronic testbed

Context

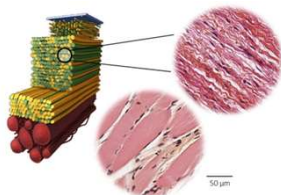
3D flow-induced vibrations of vocal folds



Produced sound



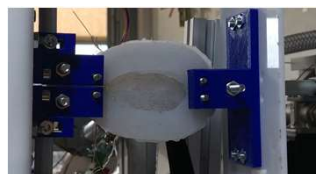
Multiscale material, structural and mechanical properties of vocal-fold tissues



Objective : to better understand and control the fluid/structure/acoustical interactions of articulated 3D laryngeal replicas, with/without acoustical loading

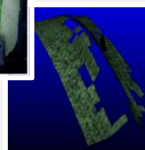
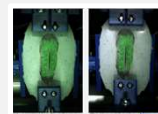
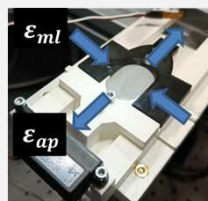
Method

A recent vocal-fold replica allowing dynamic laryngeal motion with tuned extensibility



Further design, optimisation and instrumentation

Better control of boundary conditions, tailored medial-lateral articulation, quantification of vibratory amplitude and strains, etc.



Parametrical study of various impacts :

- Glottal geometry and boundary conditions
- Vocal-fold meso / microstructure
- Acoustical loading

Results

$\epsilon_{ap} = 0,2$
 $\Phi = 2 \text{ L/s}$

