

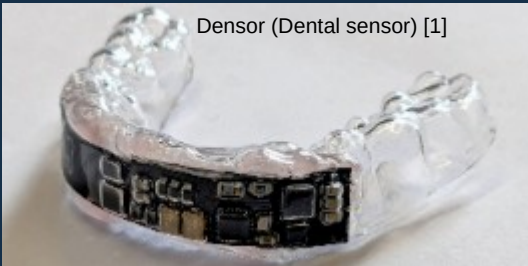
Why?

To monitor oral health and prevent a dry mouth it is important to measure hydration in saliva, and preferably continuously over longer periods.

No existing Capacitance-based method was found that could measure for longer periods, often due to size.

In a larger effort to expand the capabilities of the **Densor** (dental sensor) by Dsouza et al. [1]:

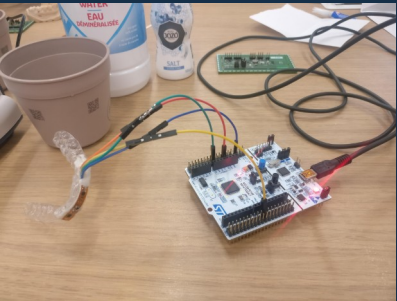
How can you measure long-term intraoral hydration levels with capacitance-based methods?



Densor (Dental sensor) [1]

Experiment Setup

- **CAP1293** capacitive sensor on **Densor**, connected to microcontroller.
- NaCl-water solutions as a proxy of saliva, starting with pure demineralised water.
- While measuring, salt is added in steps around range of electrolytes found in saliva.



Setup:

Results & Conclusions

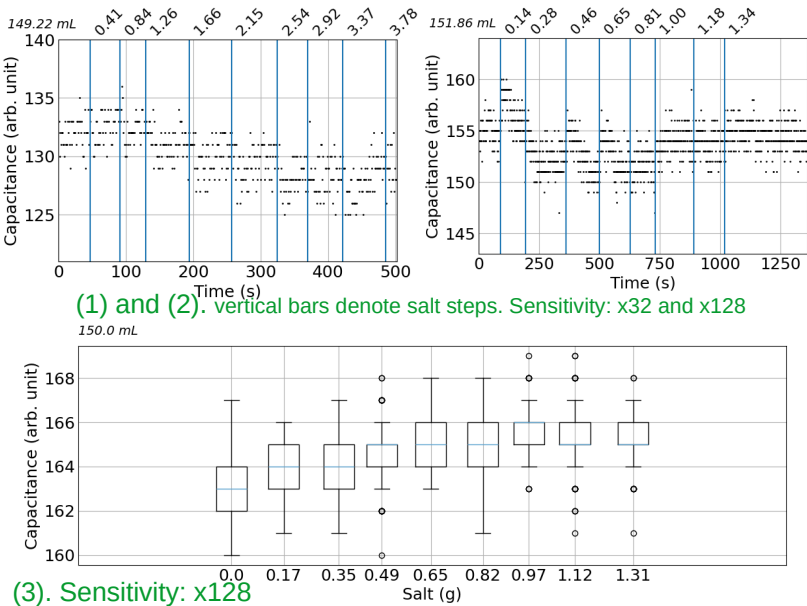
Over 14 tests, varying in delta sensitivity, and duration between salt steps:

- No significant correlation found as seen in (1), (2) [raw data] and (3) [boxplots per salt level].
- Pearson's Correlation Coefficient (ρ) calculated on **Mean** and **SD**. Avg. ρ of all tests: **0.024** & **-0.230** respectively, suggesting no correlation.
- Large fluctuation of ρ -values between tests.

No definite conclusions can be made due to limited test size.

Future work

- Repeat experiment on all variants and on fake saliva or in vivo.
- Reduce epoxy layers on CAP1293 sensor to improve readings.



References:

[1]: Dsouza et al. Densor: An intraoral battery-free sensing platform. 2024. <https://doi.org/10.1145/3699746>.

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