Supplementary Materials:

Table S1. Comparison between recent studies and their fabrication approach.

Active Layer Mold	Layer Uniformity	Ease of Fabrication	Shape/Size Versatility	Scalability	Miniaturization	Ref.
3D printed	✓	✓	✓	✓	×	[4]
Sugar cube template	×	✓	×	×	✓	[5]
Si-based	✓	×	✓	✓	×	[6]
SU8	✓	×	✓	✓	×	[7]
Photoresist	✓	×	✓	✓	×	[1]
Photoresist	✓	✓	✓	✓	✓	This work

For parallel-plate capacitive sensors, the capacitance (C) can be expressed using equation (S1):

$$C = \frac{\varepsilon_0 \varepsilon_r A}{d} \quad \text{(S1)}$$

where ε_r is the relative constant of the dielectric material, ε_0 is the permittivity of free space, A is the opposite area of the electrodes, and d is the distance between the electrode plates. Equation (S2) is based in the work of Zhang, W. et al [8] who developed an equation model to determine the nominal capacitance of a microstructured dielectric layer. The adaptation was made to include two lamination layers between the conical structures and the electrodes. This was done with the purpose of simulating a design closer to the fabricated one.

$$C = \frac{\varepsilon_0 A}{d} \cdot [\varepsilon_{air}(1-\eta) + \varepsilon_{dielectric}\eta] \quad \text{(S2)}$$

With

$$\eta = \frac{1}{3}\pi R^2 h a^2 + 2Al \quad \text{(S3)}$$

and

$$d = h + 2l \quad \text{(S4)}$$

where ε_{air} is the permittivity of the air, $\varepsilon_{dielectric}$ is the permittivity of the dielectric material, η is the occupied volume of the microstructured dielectric layer, R is the radius of the micro-cone base, h is the height of the micro-cone, a is the number of micro-cones in the row of the array, and l is the thickness of the lamination layer.

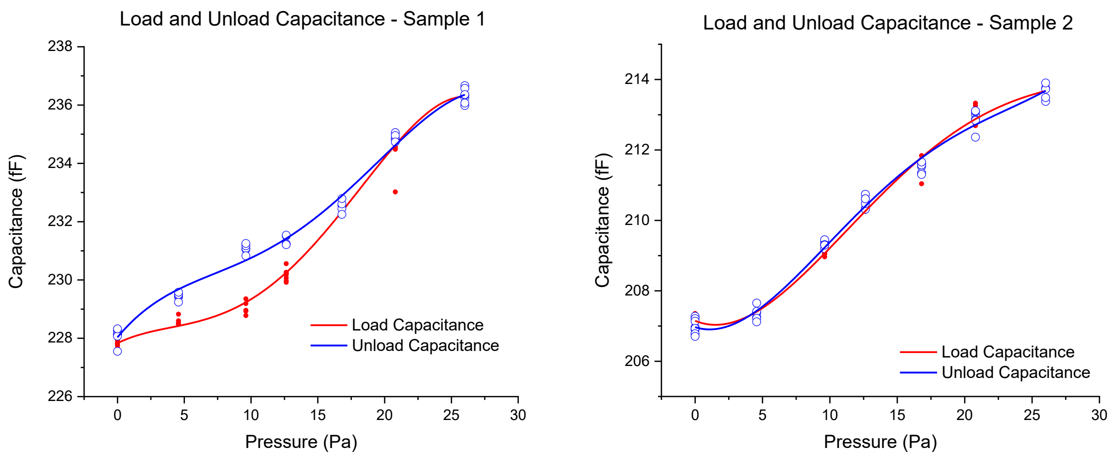

Figure S1. Load (red) and unload (blue) capacitance of sample 1 (left) and sample 2 (right).

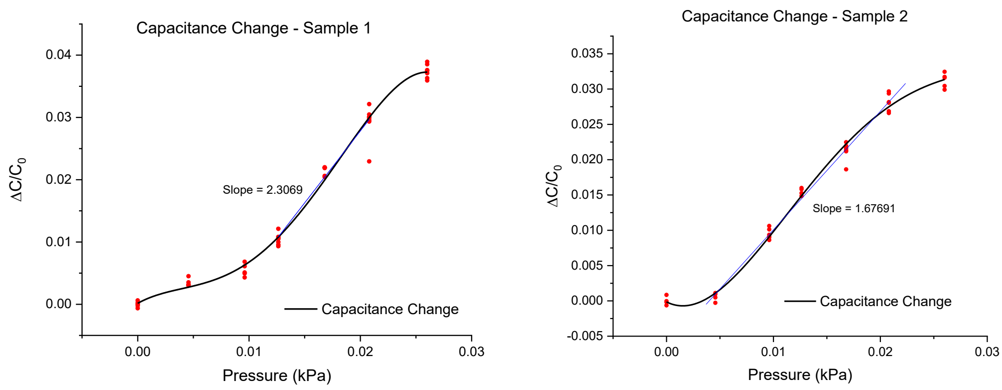

Figure S2. Sample 1 capacitance change (left) with sensitivity of 2.3069 kPa^{-1}. Sample 2 capacitance change (right) with sensitivity of 1.67691 kPa^{-1}.