Introduction:
➢ The attempt has taken to design a ultrasonic Micro Electronics Mechanical System (MEMS) of non-contact temperature sensor.
➢ The piezoelectric material is used both transmitter & receiver ends for the miniature ultrasonic device.
➢ In order to curb the expenses and save time, MEMS preferred to be done through a multidisciplinary simulation platform to test the feasibility of the proposed system.

Computational Method:
➢ Speed of sound , Density of Air and Temperature of the Air correlated each other.
➢ They are defined as below

\[
T = \left( \left( \frac{V}{c_0} \right)^2 - 1 \right) \times 273.15 \\
T = \left( \frac{P}{273.15} - 273.15 \right)
\]

Fig-1: Speed of sound vs. Temperature 
Fig-3: Air Density vs. Temperature 
Fig-9: Generated Voltage vs. Receiving Pressure 
Fig-10: Generated Voltage vs. Temperature

Model Optimization:
Transmitter & Receiver Thickness Optimization:
➢ The transmitter and the receiver is optimized for maximum transmitting pressure and for maximum generated voltage respectively at a constant width of 0.5475 cm the thickness of the transmitter and the receiver are varied from 0.01 cm to 0.0885 cm.

Result & Discussion:
➢ The operating frequency of the transmitter is varied from 20 KHz to 80 KHz at a constant supplied voltage of 10 volts.
➢ The optimum transmitting pressure and generated voltage is obtained at optimized frequency of 40 KHz.

Conclusion:
➢ Quartz is used to design this MEMS device, which squanders its piezoelectric property around 880 Deg. Celsius.
➢ The temperature limitation is not exclusively related to the piezoelectric material’s curie point and for successful design, all materials used in the construction of a device need to be consider.
➢ For contactless sensing of very high temperature piezoelectric technology is highly efficient.