

Introduction to WiFi Sensing



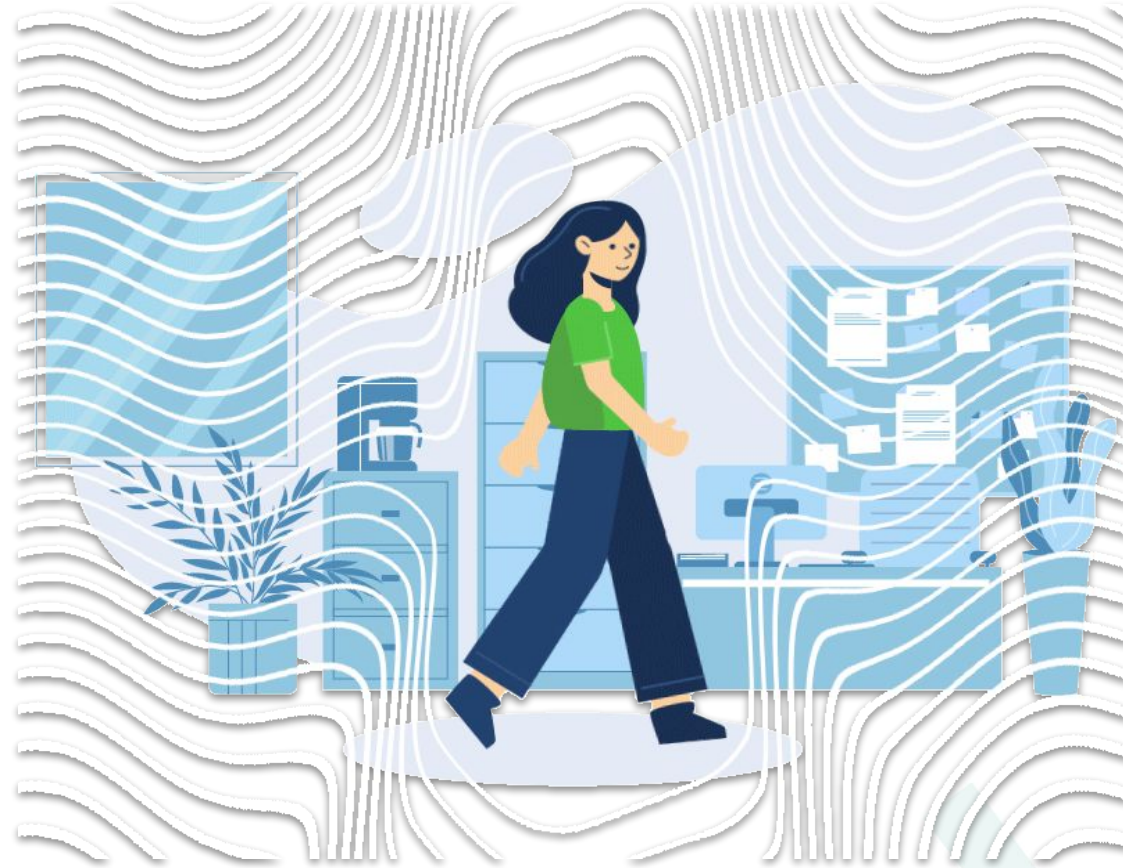
INDRAPRASTHA INSTITUTE *of*
INFORMATION TECHNOLOGY
DELHI



WiFi Sensing



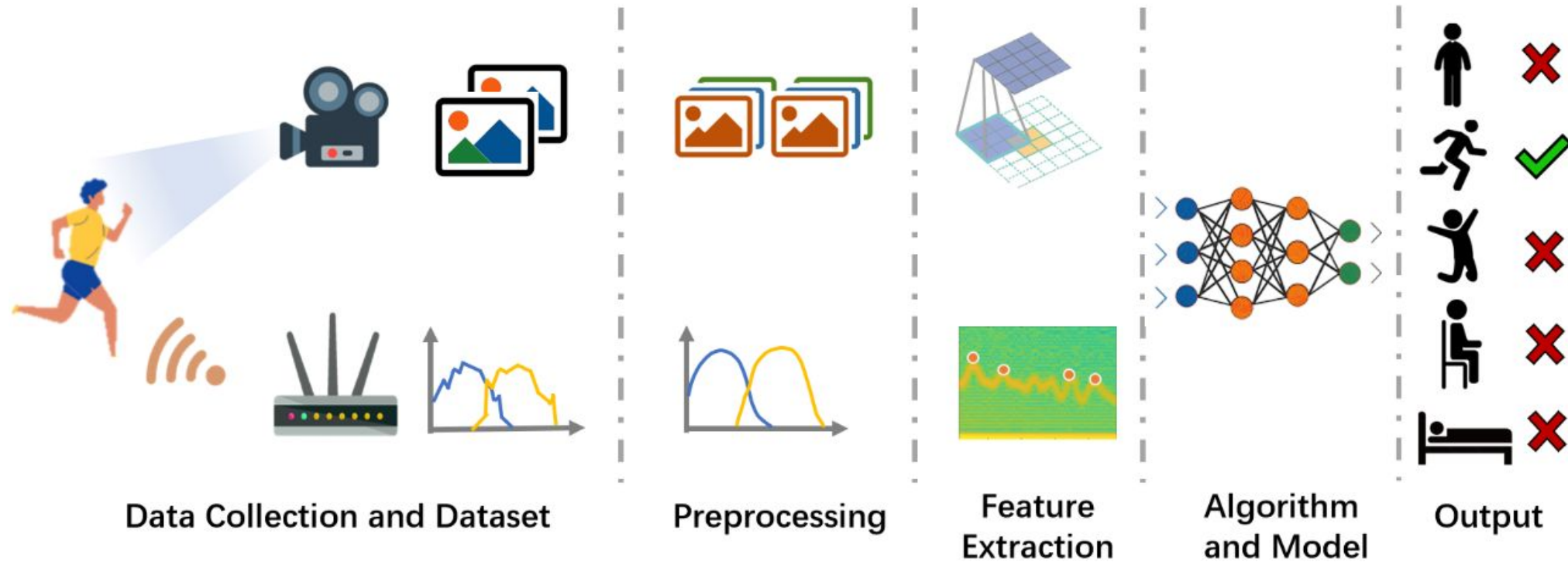
WiFi Access Point



WiFi Receiving device

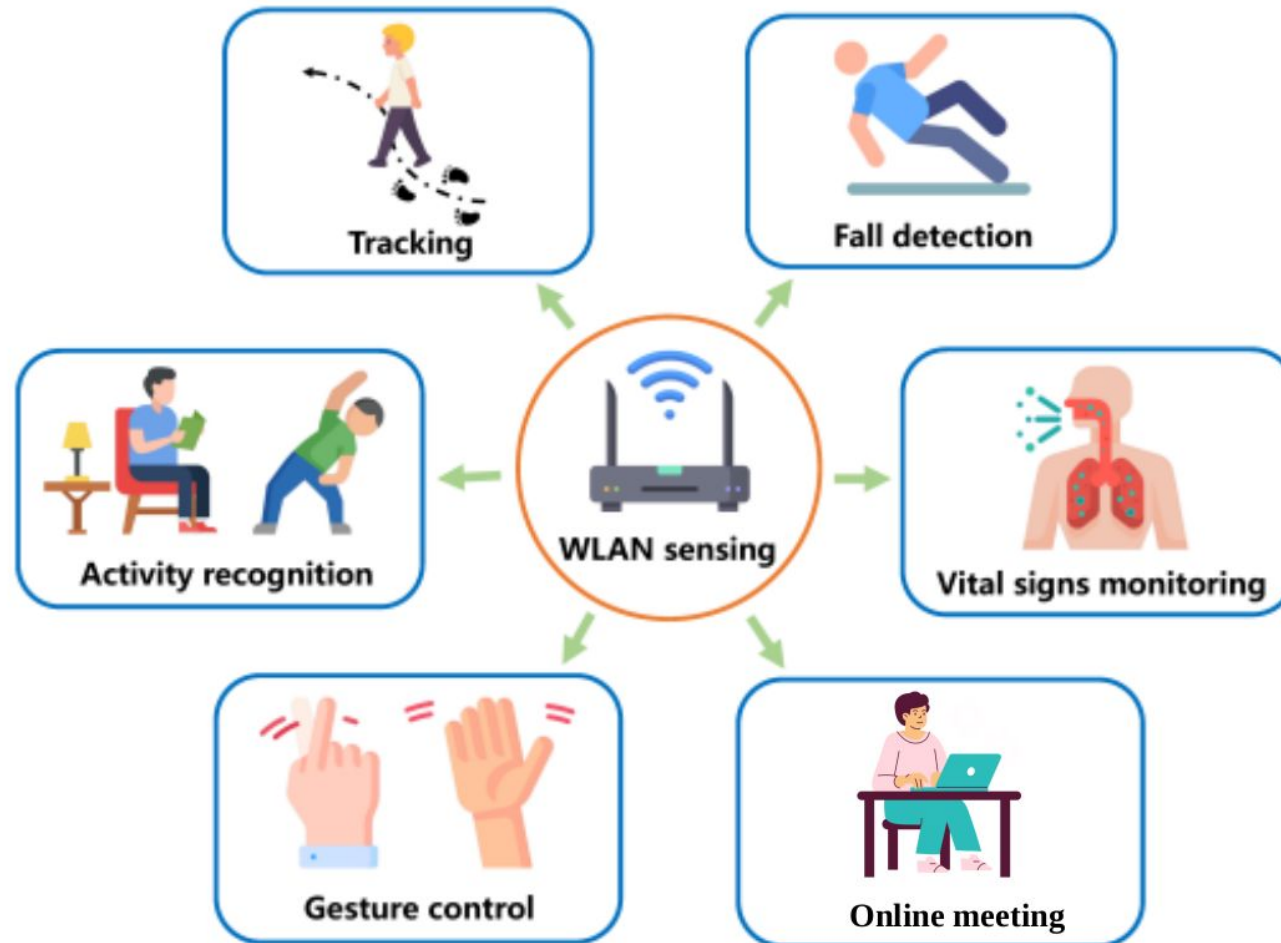
Non-intrusive, Pervasive, Low-cost

Comparison with Video-based Sensing



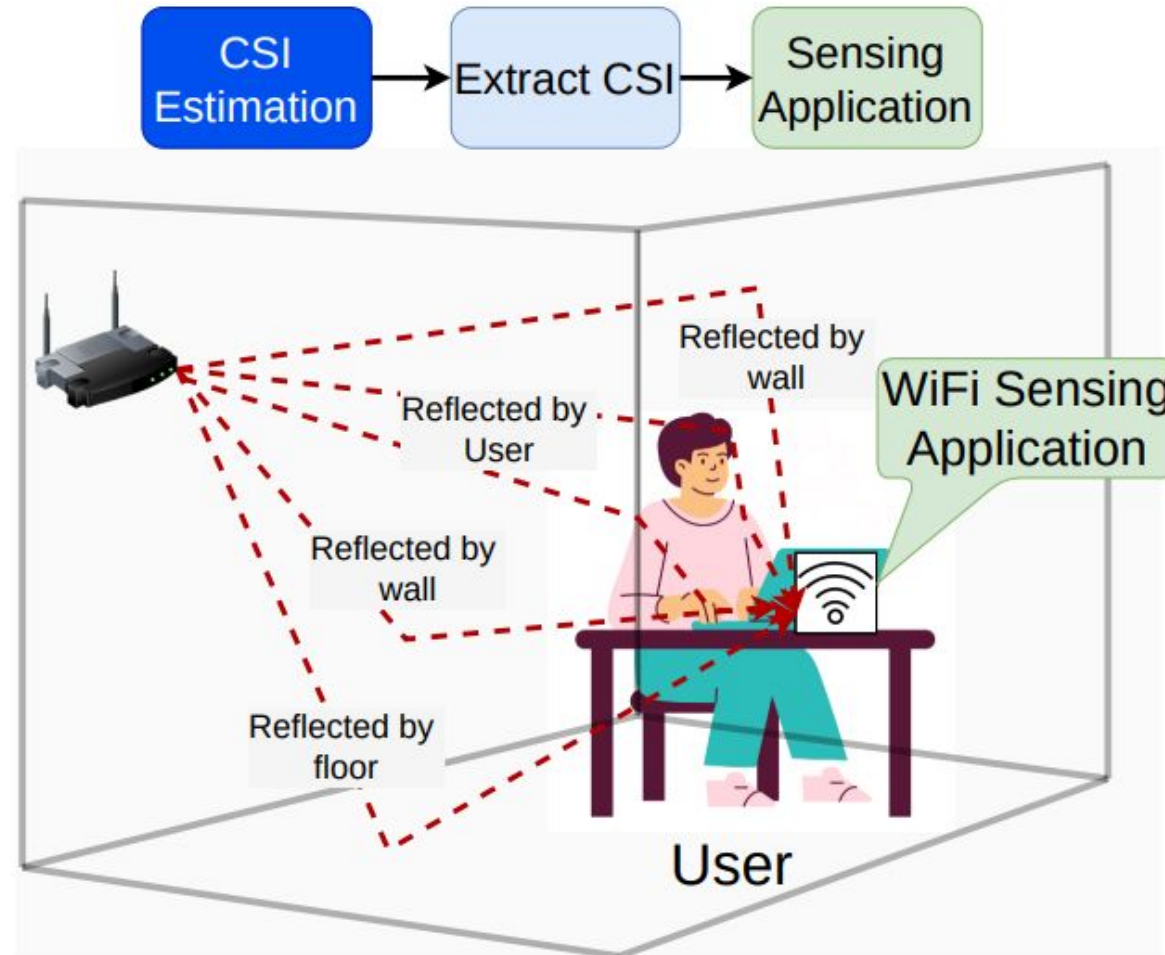
WiFi Sensing and video-based sensing share similar process

CSI-based WiFi Sensing Applications

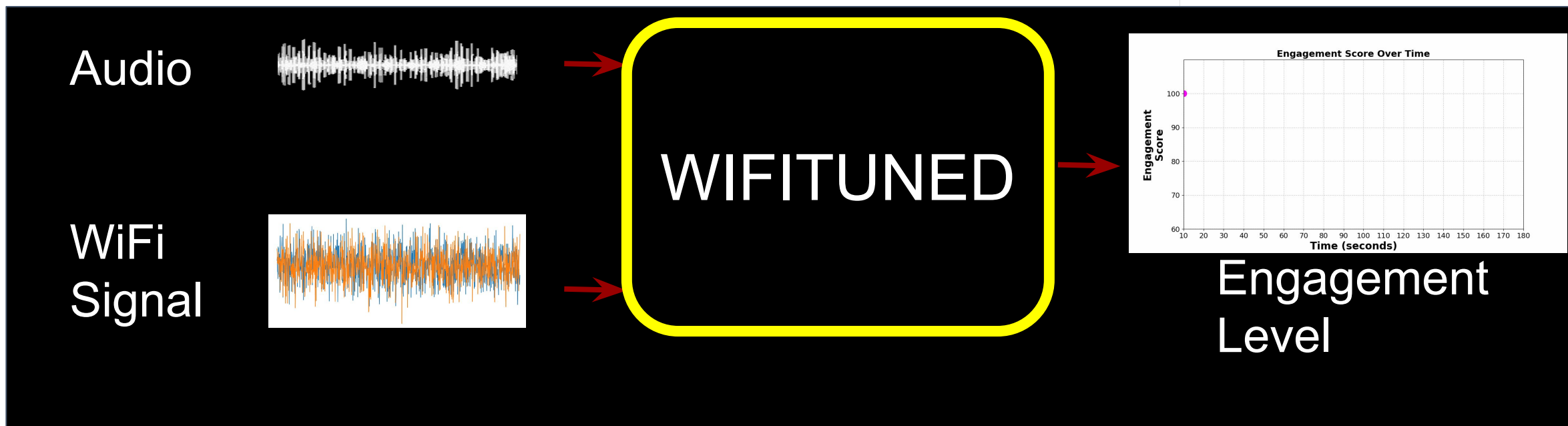


Application of WiFi Sensing

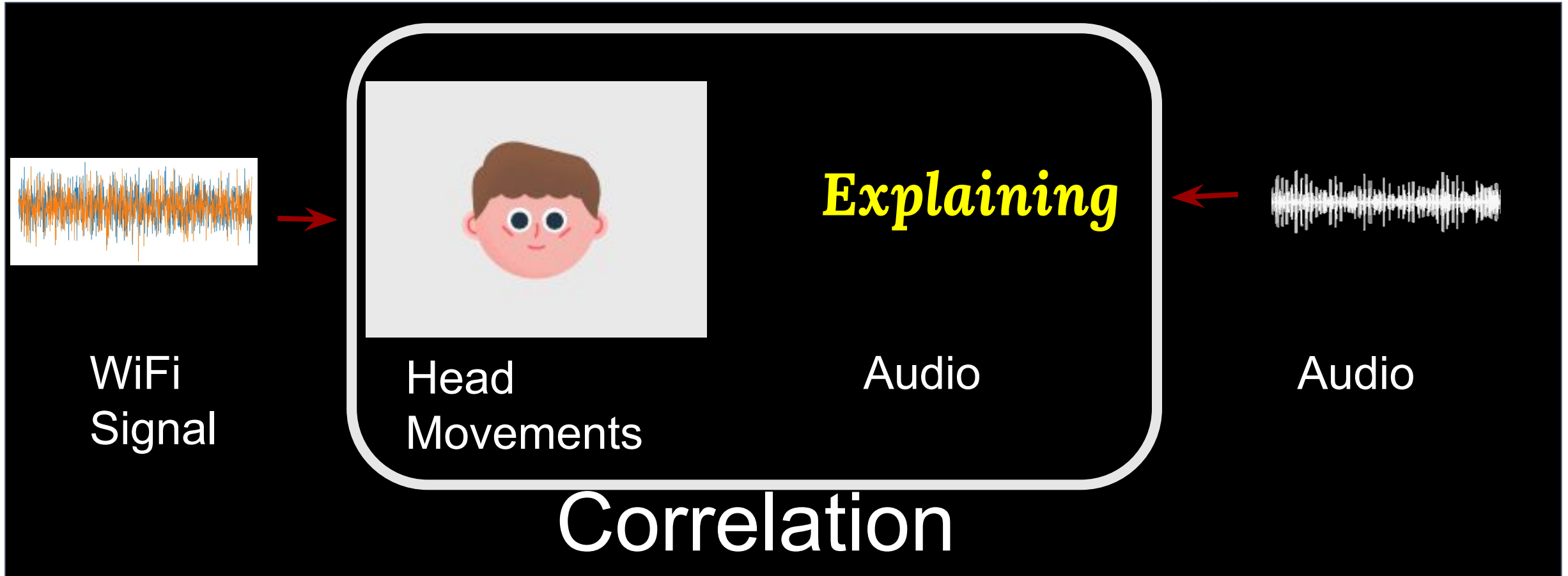
CSI-based WiFi Sensing Scenario - WIFITUNED



Monitoring engagement in online meetings in indoor environment

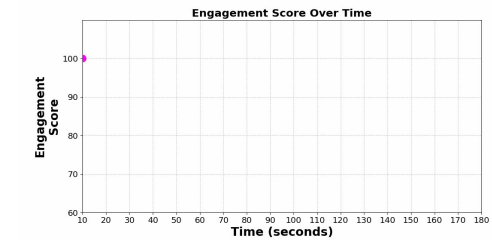
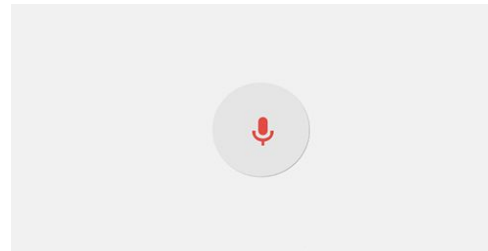


Monitoring engagement in online meetings in indoor environment



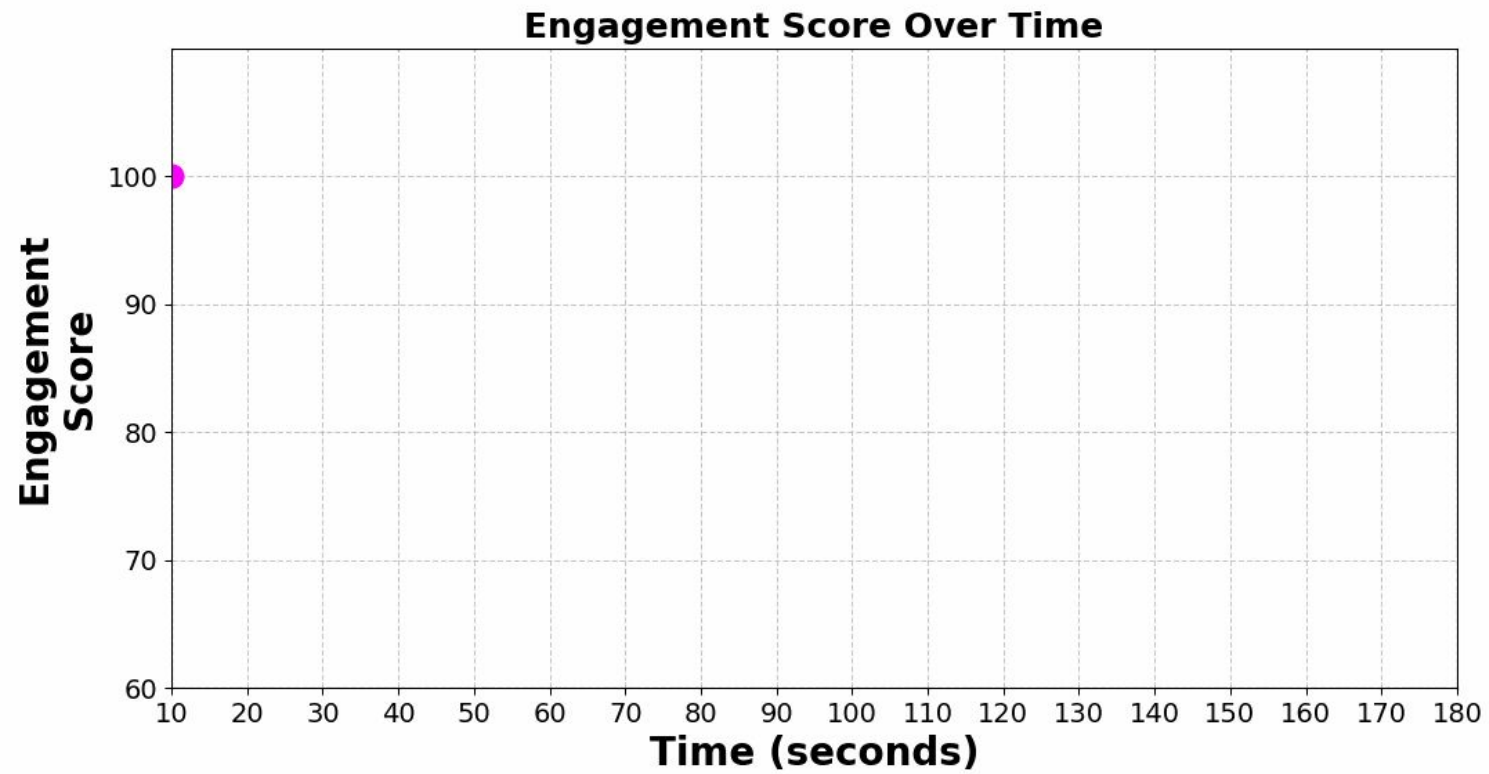
WiFi Signal as input modality to capture head movements

Here is the demonstration of WIFITUNED



Live demo

Final Output



Final Output

```
CSI_DATA,STA,B0:00:B4:20:63:A3,-74,9,0,0,0,0,0,0,0,0,0,-96,0,1,0,7423355,0,238,0,0,7.59828,128,[-18 -32 1
4 0 -13 -2 -10 -6 -8 -10 -8 -11 -13 -18 -5 -16 1 -12 3 0 6 -1 14 2 12 6 15 15 18 17 27 22 26 25 31 23 32
21 31 17 30 17 30 13 31 12 28 11 26 4 24 1 20 -3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 6 -12 4 -13
4 -19 4 -19 9 -18 6 -20 8 -18 8 -13 7 -10 7 -5 3 0 6 0 9 5 4 13 10 16 15 11 11 22 11 21 8 25 13 19 11 25
3 22 11 18 4 17 4 10 5 7 ]
```

```
CSI_DATA,STA,C4:0A:CB:2D:83:E1,-57,9,0,0,0,0,0,0,0,0,-96,0,1,0,7445413,0,284,0,0,7.61771,128,[28 -63 17
0 -16 -4 -18 -3 -18 -2 -20 -3 -20 -2 -20 -2 -21 -1 -21 0 -22 1 -21 2 -22 3 -22 4 -22 6 -23 7 -24 8 -24 9
-26 10 -27 10 -27 11 -28 11 -29 12 -30 12 -32 12 -34 11 -37 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 16 0 15 2 14 3 11 5 10 5 8 5 6 5 4 4 2 4 1 3 -1 2 -2 0 -2 0 -3 -2 -4 -3 -5 -3 -6 -4 -6 -5 -7 -5 -7 -5 -
8 -4 -8 -5 -10 -4 -11 -5 -12 -2 -13 -4 ]
```

```
CSI_DATA,STA,C4:0A:CB:2D:83:E3,-56,9,0,0,0,0,0,0,0,0,-96,0,1,0,7470300,0,235,0,0,7.64253,128,[-21 -80 1
4 0 -9 -13 -13 -20 -11 -18 -13 -19 -14 -18 -15 -19 -16 -18 -17 -18 -18 -17 -19 -16 -21 -16 -23 -15 -24 -1
5 -25 -14 -27 -14 -28 -13 -30 -14 -31 -15 -32 -15 -34 -16 -35 -16 -35 -16 -37 -18 -38 -21 -37 -25 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 14 12 11 13 8 13 6 13 4 11 2 10 1 8 -1 6 -1 4 -2 2 -2 0 -2 -2 -1 -3
-1 -6 -1 -7 -1 -7 -1 -9 -2 -9 -1 -11 -1 -11 -2 -12 -3 -13 -4 -12 -5 -13 -6 -14 -7 -16 ]
```

```
CSI_DATA,STA,C4:0A:CB:2D:83:E5,-57,9,0,0,0,0,0,0,0,0,0,-96,0,1,0,7482277,0,228,0,0,7.6545,128,[-28 64 14
0 11 19 9 15 11 16 11 16 13 16 14 16 15 16 15 15 17 15 17 14 19 13 20 13 22 13 23 12 25 12 25 12 28 12 28
12 30 13 31 14 32 14 33 14 34 16 35 19 35 23 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 -14 -14 -11 -15
-8 -15 -6 -14 -4 -13 -2 -11 -1 -9 0 -7 2 -5 1 -3 2 -1 1 1 1 2 1 4 1 5 0 6 0 7 1 8 1 8 1 9 1 10 2 10 4 11
5 11 5 12 7 13 ]
```