

Supplementary Material

FluNet: An AI-Enabled Influenza-like Warning System

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Methods (Experimental Design)

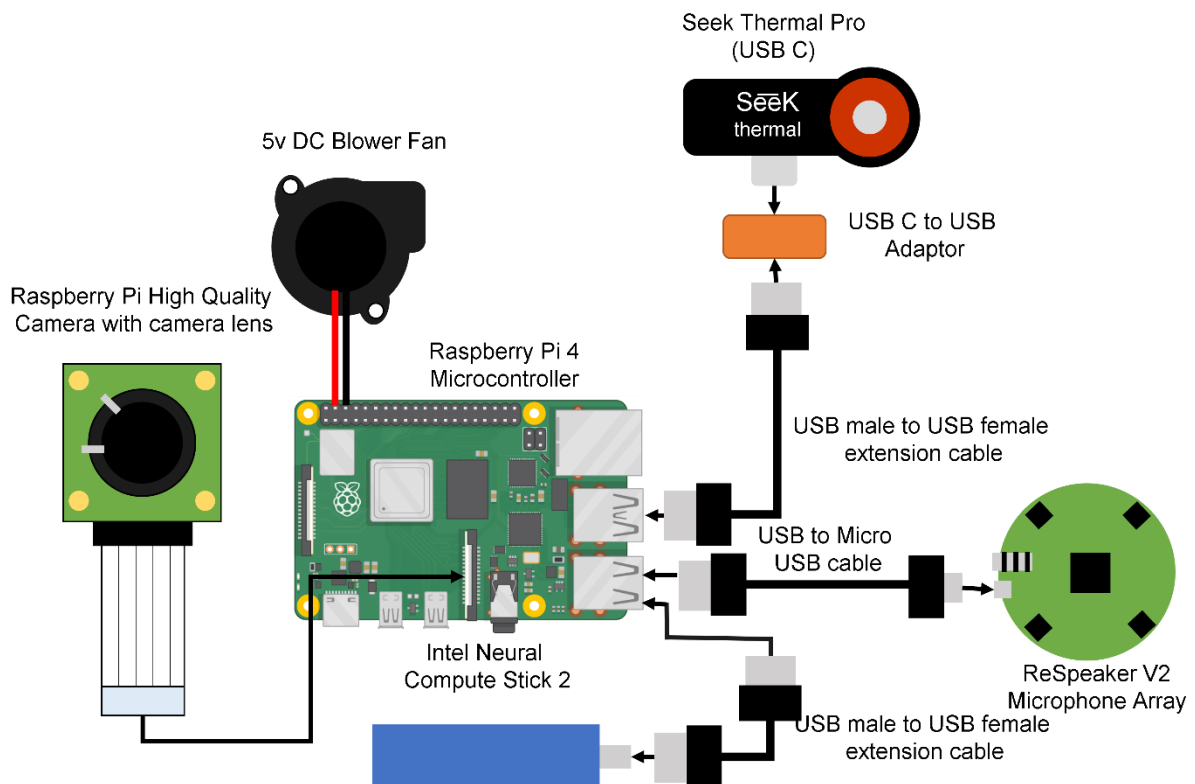


Fig S1. Hardware setup for the FluNet system.

Face Detection

Link to TUFTS thermal face dataset; <https://www.kaggle.com/kpvisionlab/tufts-face-database-thermal-td-ir>

This dataset was used in conjunction with our collected data to train the face detector.

Cough Detection (Data Sources)

The list below indicates the YouTube clips where the cough sounds were taken from.

Clips used for training & validation

<https://www.youtube.com/watch?v=jxYNLCYTzwZQ>
<https://www.youtube.com/watch?v=qfpJg179YNk>
<https://www.youtube.com/watch?v=d2wkdrScerU>
<https://www.youtube.com/watch?v=ct3tHDfNKiQ>
https://www.youtube.com/watch?v=Dc_aoUCqw2E
<https://www.youtube.com/watch?v=tvHytTIGs0M>
<https://www.youtube.com/watch?v=0QQxKN-KC1U>
<https://www.youtube.com/watch?v=DYfjPnty2Ho>
<https://www.youtube.com/watch?v=q6WsoL3J8U8>
<https://www.youtube.com/watch?v=CTSLdNxN1cc>
<https://www.youtube.com/watch?v=tfc5cXiXMDc>
https://www.youtube.com/watch?v=rkF_uMizqoc

<https://www.youtube.com/watch?v=5905FxxZ9dl>
<https://www.youtube.com/watch?v=lzPMblll3LE>
<https://www.youtube.com/watch?v=h2FLCKMcEX0>
<https://www.youtube.com/watch?v=2Mw-s5jngXU>
<https://www.youtube.com/watch?v=diuuEXKzNB8>
<https://www.youtube.com/watch?v=dg-l9j76-t8>
<https://www.youtube.com/watch?v=TK4CveeCWfY>
<https://www.youtube.com/watch?v=4k0ziD0j5BI>
<https://www.youtube.com/watch?v=CsDXlt7Ei1c>
https://www.youtube.com/watch?v=7Ez5Wc_esBg
<https://www.youtube.com/watch?v=NaOVmYoljbs>
<https://www.youtube.com/watch?v=XrpB4DTNQZw>
<https://www.youtube.com/watch?v=h-GtQfDCoaE>
<https://www.youtube.com/watch?v=u2KMBD5-oCg>
<https://www.youtube.com/watch?v=A5s2ZgwQ1VM>
<https://www.youtube.com/watch?v=ekqLlw-Xe68>
<https://www.youtube.com/watch?v=6LK6yHtlung>
<https://www.youtube.com/watch?v=tZtJaS2ZtME>
<https://www.youtube.com/watch?v=AQOelVbhFm4>
<https://www.youtube.com/watch?v=zjd4HrJbc8o>
<https://www.youtube.com/watch?v=1UDFq2InljM>
<https://www.youtube.com/watch?v=LkxvBb2VXbs>
https://www.youtube.com/watch?v=i_hl3gVoRr0
https://www.youtube.com/watch?v=3id3zRRZBVM&list=PLKUX6UbAKeUC5_4rOY0W1Q6RjyYLHoWU
https://www.youtube.com/watch?v=3gFShyvw8iU&list=PLKUX6UbAKeUC5_4rOY0W1Q6RjyYLHoWU&index=2
https://www.youtube.com/watch?v=lH6ym1UrInE&list=PLKUX6UbAKeUC5_4rOY0W1Q6RjyYLHoWU&index=3
https://www.youtube.com/watch?v=4WyFn2L44m0&list=PLKUX6UbAKeUC5_4rOY0W1Q6RjyYLHoWU&index=5
https://www.youtube.com/watch?v=GkWQbUPBDry&list=PLKUX6UbAKeUC5_4rOY0W1Q6RjyYLHoWU&index=7

Clips used for background sounds

<https://www.youtube.com/watch?v=fuwGT88P-RU>
<https://www.youtube.com/watch?v=BOdLmxy06H0>
<https://www.youtube.com/watch?v=8trgESN1Eks>
<https://www.youtube.com/watch?v=Hx3vzG8Uahk>
<https://www.youtube.com/watch?v=Hym8S0CqtW0>
<https://www.youtube.com/watch?v=sJU14CH4f-c>
<https://www.youtube.com/watch?v=ZSrVznkaMEM>
<https://www.youtube.com/watch?v=Uj0DuD92Tik>
<https://www.youtube.com/watch?v=ttgBegSSyTs>

Clips used for the background merged into cough sounds

<https://www.youtube.com/watch?v=IKB3Qiglyro>
<https://www.youtube.com/watch?v=dZHnol-qDyA>

The list below indicates the YouTube clips used to test the artificial neural network;

Background sounds merged into the cough sounds

<https://www.youtube.com/watch?v=ZhQx8z5BCzY&t=21s>

<https://www.youtube.com/watch?v=w1yTt5wkUwI>

<https://www.youtube.com/watch?v=ZD47Mhzm-CU>

<https://www.youtube.com/watch?v=zAQacLrItNY>

Cough sounds

<https://www.youtube.com/watch?v=MV9TaoN7cHw>

<https://www.youtube.com/watch?v=BwfscnYTnNA>

<https://www.youtube.com/watch?v=JzbPkywYfh0>

<https://www.youtube.com/watch?v=gZcFgmlqX6k>

<https://www.youtube.com/watch?v=TcmaHbc2xbE>

<https://www.youtube.com/watch?v=jjwWAtmYYtw>

<https://www.youtube.com/watch?v=ZD47Mhzm-CU>

<https://www.youtube.com/watch?v=KkEWHls-tHY>

[https://www.youtube.com/watch?v=86yCdiE3rYA&list=PLWMgRXX-](https://www.youtube.com/watch?v=86yCdiE3rYA&list=PLWMgRXX-UehKekLdKDuCVM3AwPoI5pnbK&index=12)

[UehKekLdKDuCVM3AwPoI5pnbK&index=12](https://www.youtube.com/watch?v=86yCdiE3rYA&list=PLWMgRXX-UehKekLdKDuCVM3AwPoI5pnbK&index=12)

Background sounds

<https://www.youtube.com/watch?v=nYWaDjr8sfs>

<https://youtubetomp3music.com/en4/download?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DDOMaHyZmbqdc>

Cough Detection (Modelling)

Table S1. Neural network training parameters.

Training Option	Parameter
Momentum	0.9
Initial learn rate	1.0000e-04
Learn rate drop factor	0.1
Learn rate schedule	None
Learn rate drop period	10
L2 Regularization	1.0000e-04
Gradient threshold method	L2norm
Gradient threshold	INF
Max epochs	15
Mini batch size	200
Validation frequency	300
Validation patience	INF
Shuffle	Every epoch
Execution environment	GPU

