Cough-based COVID-19 detection

with audio quality clustering and confidence measure based learning

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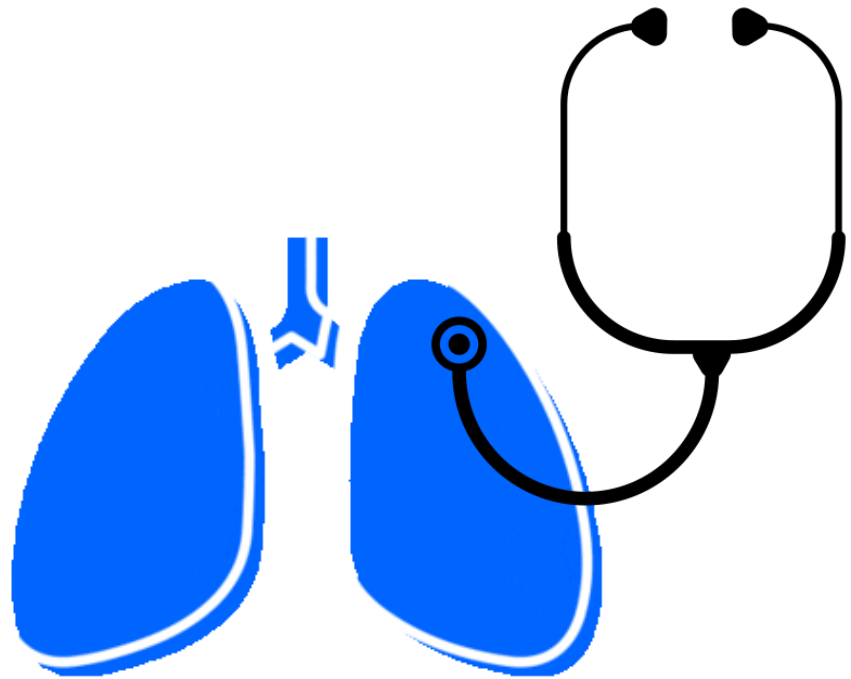
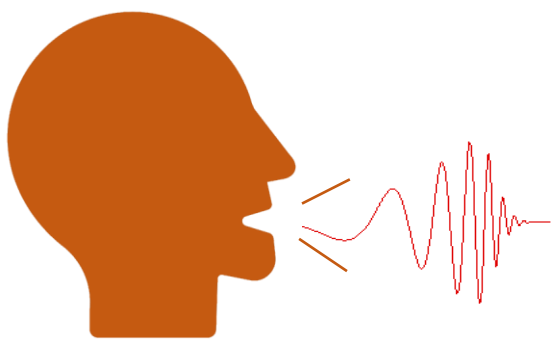
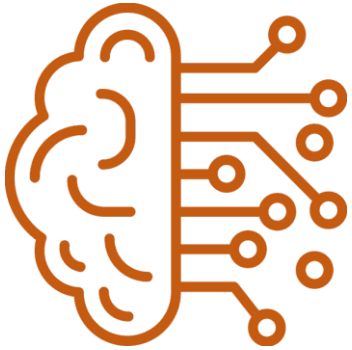
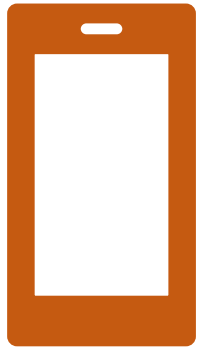


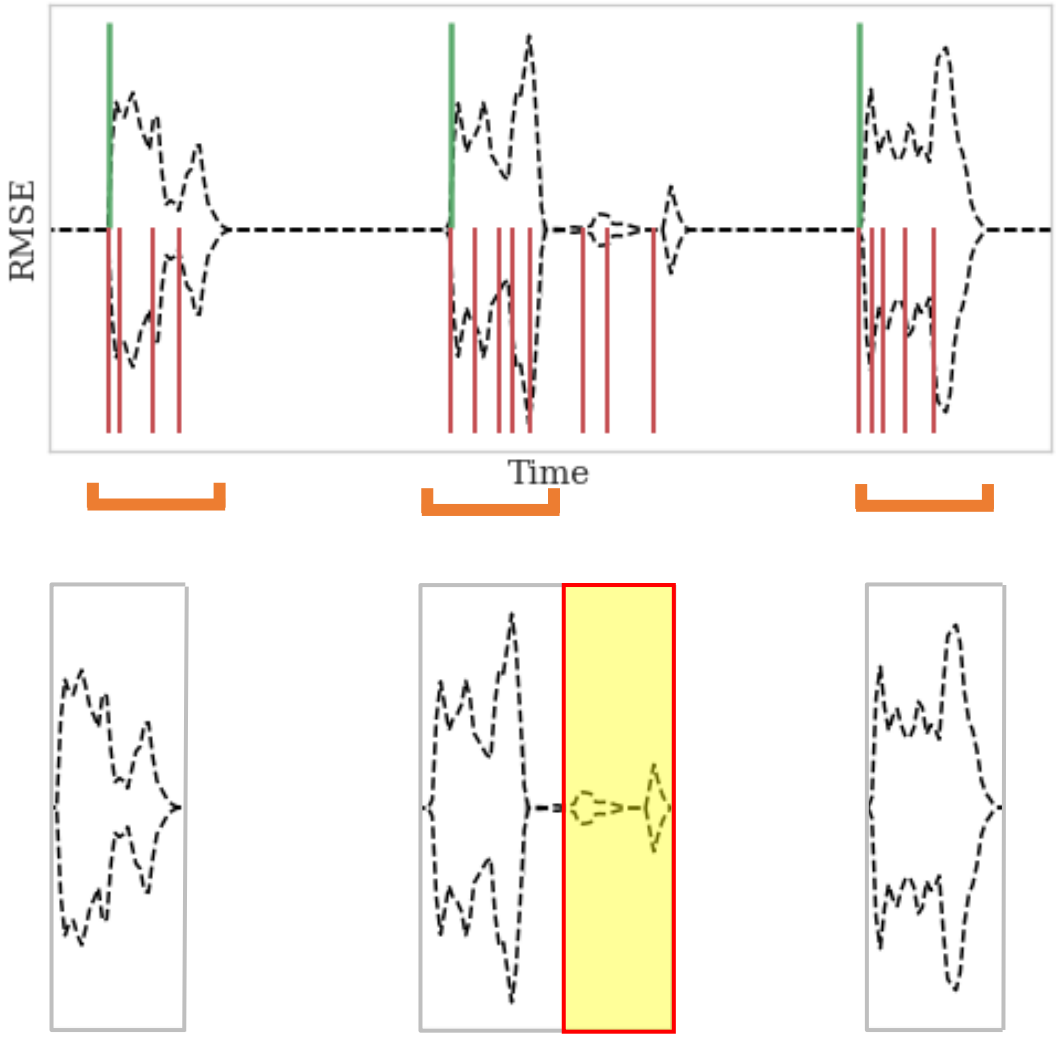
Why coughs?







Isolating cough clusters



Our filtered onset

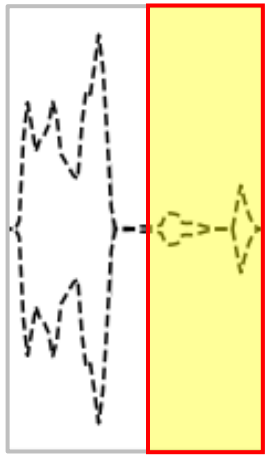
Standard onset

Segmented samples

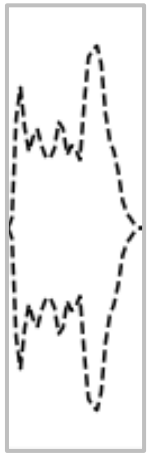
Class-agnostic normalised NCM

$$NCM_{SNR}(x, \hat{y}) = \frac{NCM(x, \hat{y})}{\sigma(x)}$$

$$\sigma(x) = SNR(x)$$



Difficulty = ++
SNR = --
NCM = ++
Pred. range = ++

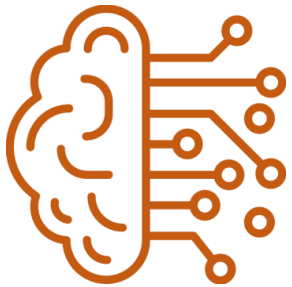


Difficulty = --
SNR = ++
NCM = --
Pred. range = --

Experiment description

Cough data	Samples
Original	487
Segmented	1448

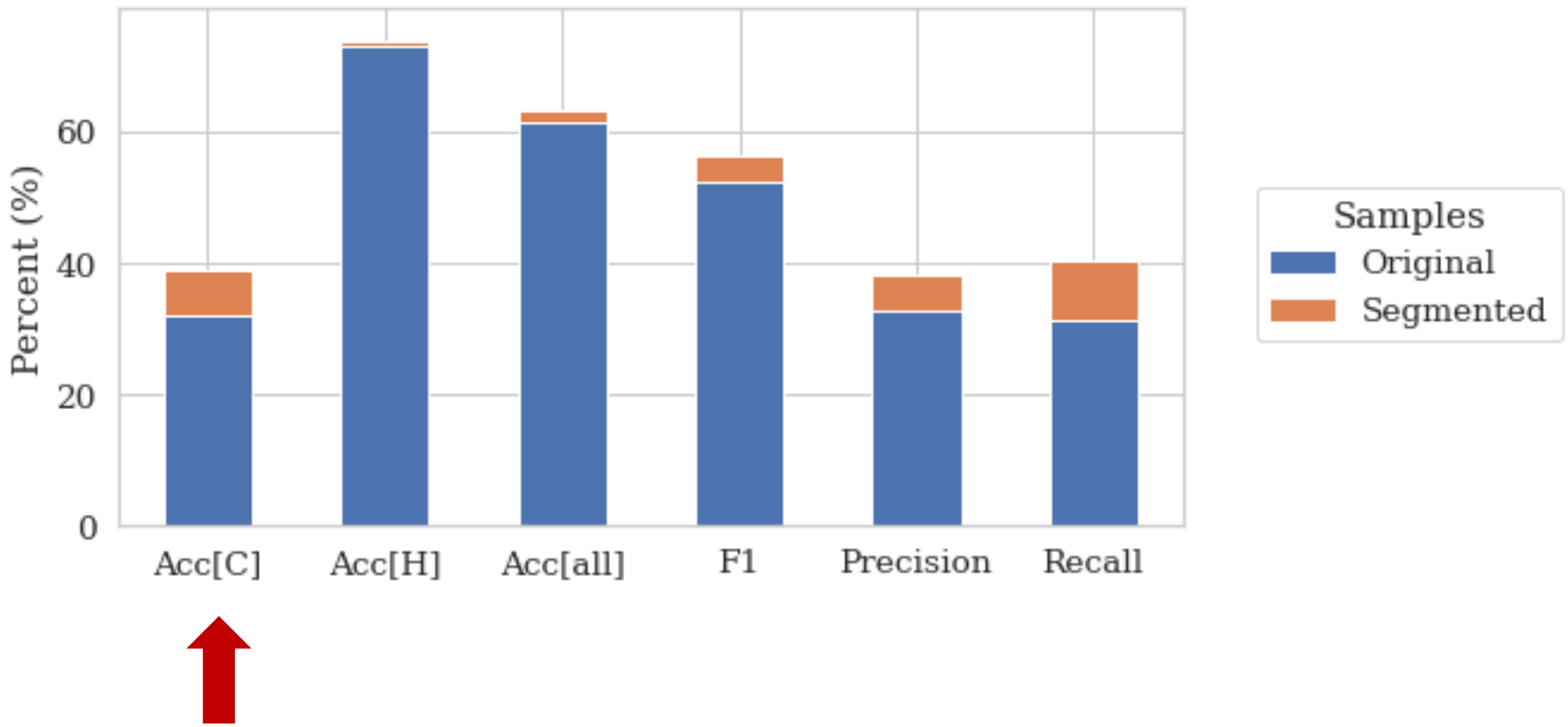
+200%



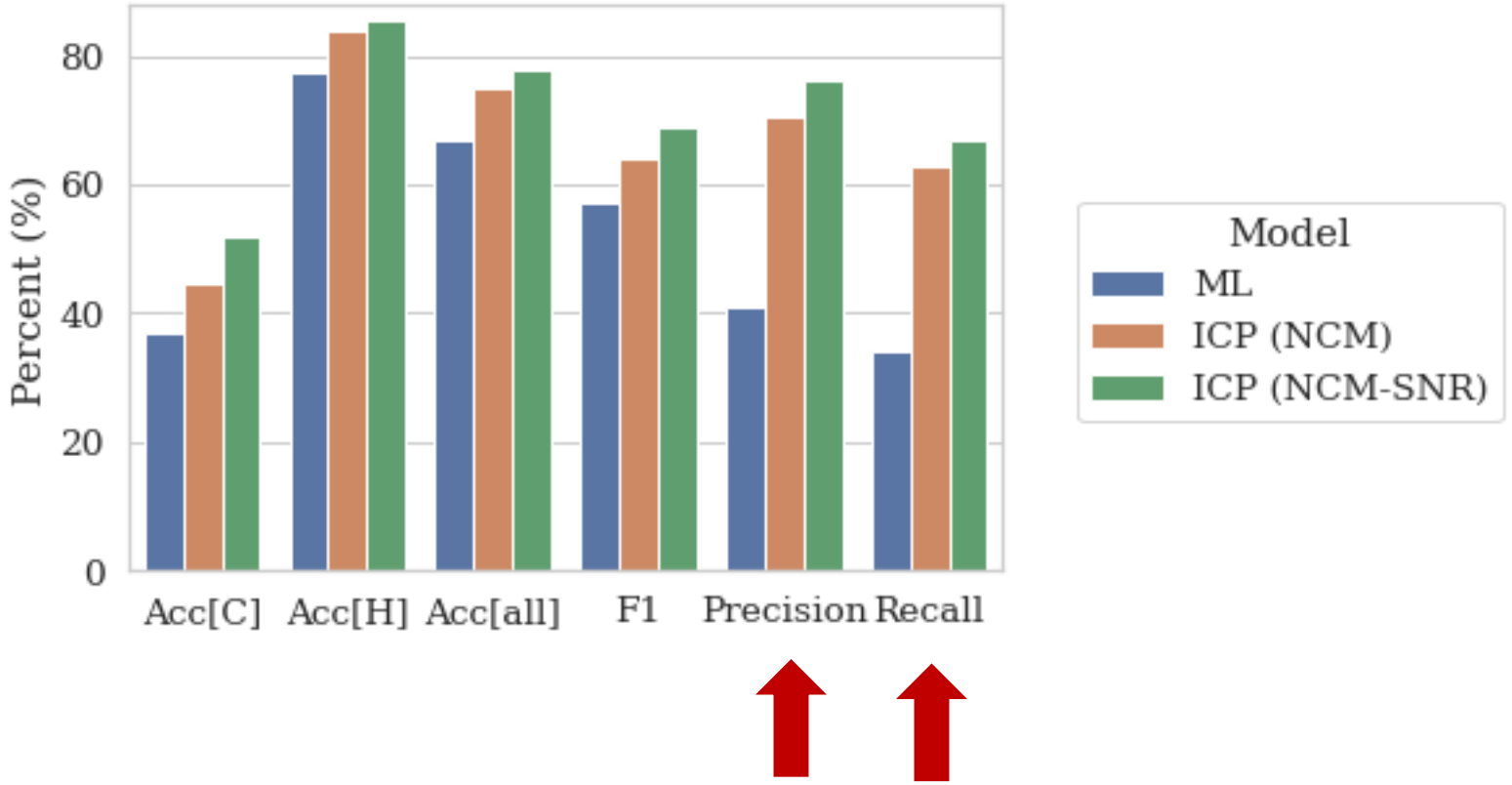
Inductive CP,
Random Forest

5-fold
Cross Validation

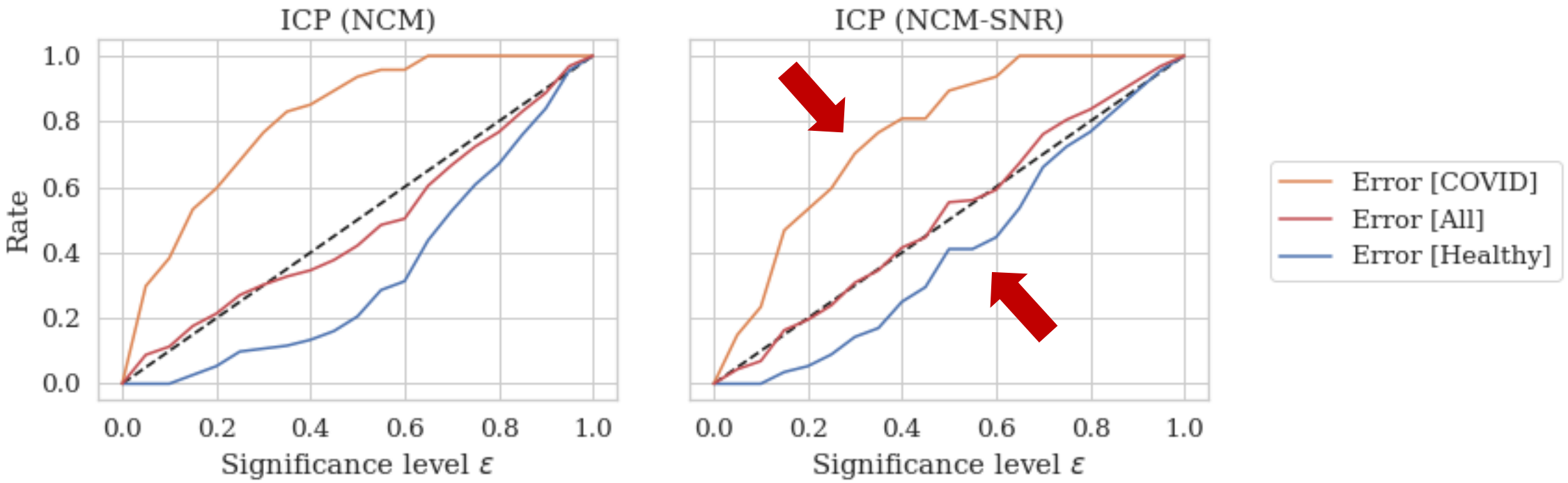
Results: Isolated cough improvements



Results: Comparing forced predictions



Results: CP with our NCM-SNR



Thank you for your attention.

Any questions?

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Attributions

- Noun Project icons:
  - Stethoscope by Mahesh Keshvala
  - Database by ✦ Shmidt Sergey ✦
  - AI by Angga Febri Prasetyo P.
  - Mobile by Prashanth Rapolu
  - Reporting by SBTS

- GIFs:
  - Lung: https://thenounproject.com/icon/stethoscope-2401260/
  - Audio wave: https://en.wikipedia.org/wiki/File:Cochlea_wave_animated.gif