

CORONASYS INNOVATION SHEET 25

COUGH-ANALYSING APP

Background

Covid-19 diagnostics have been advanced in unprecedented speed over the last months. Most of them however focused on laboratory testing and virus detection¹. Researchers of the Massachusetts Institute of Technology² have developed an AI model that could diagnose Covid-19 by analysing cough and voice samples.

Features

The researchers built a large database of tens of thousands of cough samples and trained an Artificial Intelligence (AI) algorithm to detect the characteristic features of Covid-19- coughs that stem from the temporary neuromuscular impairment caused by the disease. The model could be used in form of an app: The user can then send a recorded forced- cough sample to the system and will get a result within minutes³.

The model is said to achieve a sensitivity of 100% and a specificity of 83.2% in asymptomatic patients⁴. Similar tools have been used before to identify patients suffering from pneumonia, asthma and even Alzheimer's^{5,6}.

Potentials

The technology could provide a free and non- invasive diagnostic tool which could be instantly distributed to screen asymptomatic people⁷. This might scale up testing capacities and mitigate barriers to get tested.

Points to consider

The app is not yet approved by the Federal Drug Administration (FDA). Researchers at Augsburg in Germany are developing a similar programme at the moment that focuses on voice samples⁸.

Conclusion

The app might add to the landscape of diagnostic devices when its effectiveness has been further proven and it has completed the approval process.

State of information: 11/08/2020

Publication: September 30, 2020

Country: USA

Focus area: AI, Diagnostics

Developer: Massachusetts Institute of Technology (MIT)

Beneficiaries: General population

¹ World Health Summit 2020. Innovations to Improve Pandemic Preparedness, 2020.

<https://www.youtube.com/watch?v=xruVNdSPw9w>.

² MIT. "The Massachusetts Institute of Technology (MIT)." Massachusetts Institute of Technology. Accessed November 9, 2020. <http://web.mit.edu>.

³ Chu, Jennifer. "Artificial Intelligence Model Detects Asymptomatic Covid-19 Infections through Cell-phone-Recorded Coughs." MIT News | Massachusetts Institute of Technology, October 29, 2020.

<https://news.mit.edu/2020/covid-19-cough-cellphone-detection-1029>.

⁴ Laguarda, Jordi, Ferran Hueto, and Brian Coventry. "COVID-19 Artificial Intelligence Diagnosis Using Only Cough Re-cordings – EMBS." embs.org, September 30, 2020. <https://www.embs.org/ojemb/articles/covid-19-artificial-intelligence-diagnosis-using-only-cough-recordings/>.

⁵ Chu, Jennifer. "Artificial Intelligence Model Detects Asymptomatic Covid-19 Infections through Cell-phone-Recorded Coughs." MIT News | Massachusetts Institute of Technology, October 29, 2020.

<https://news.mit.edu/2020/covid-19-cough-cellphone-detection-1029>.

⁶ Foy, Kylie. "Signs of Covid-19 May Be Hidden in Speech Signals." MIT News | Massachusetts Institute of Technology, August 7, 2020. <https://news.mit.edu/2020/signs-covid-19-may-be-hidden-speech-signals-0708>.

⁷ Laguarda, Jordi, Ferran Hueto, and Brian Coventry. "COVID-19 Artificial Intelligence Diagnosis Using Only Cough Recordings – EMBS." embs.org, September 30, 2020. <https://www.embs.org/ojemb/articles/covid-19-artificial-intelligence-diagnosis-using-only-cough-recordings/>.

⁸ Ärzteblatt. "Forscher wollen Coronainfektion an der Sprache erkennen." Deutsches Ärzteblatt, November 6, 2020. <https://www.aerzteblatt.de/nachrichten/118103/Forscher-wollen-Coronainfektion-an-der-Sprache-erkennen>.

Background on Innovation Sheet Series

As part of a real-time evaluation of the SARS CoV 2 pandemic (with focus on epidemiological, medical, economical, societal, technical, and cultural developments in Germany and Armenia) the CoronaSys research team, under the leadership of Prof. Dr. Martin Voss, is conducting a continuous monitoring of developments and medical, technical, and social innovations concerning Covid-19.

Multiple national and international media outlets, research platforms, and scientific and organizational guidelines, briefs, and updates are screened to feed into this outlet. The rationale behind this is to support the projects' network partners in Armenia and Germany with short summaries of key developments and promising innovations that are shaping the global, German, and Armenian outbreak response and recovery.

The aim of these short briefs is to give condensed and structured information on selected innovations emerging out of the conducted horizon scanning. This could be mainstream big-ticket items or fringe subjects that are easily overlooked in the global flood of information. Some innovations will be followed through their evolution in time while others may only appear once. While subjectively selected, the briefs are descriptive in nature and leave analysis and critical interpretation to the reader. Network partners in both countries are invited to provide feedback on their interest areas and suggest particularly relevant topics for the CoronaSys Workshop series.

The CoronaSys Innovation Sheet Series is published by the [Academy of the Disaster Research Unit](#), which is, as a non-profit limited liability company, a spin-off of the [Disaster Research Unit](#) at the Free University of Berlin. The series is part of the research project "[CoronaSys](#): Addressing the corona pandemic in Armenia through systemic risk management", sponsored by the German Federal Ministry of Education and Research.

If you have any questions, suggestions, or if you wish to be taken on (or off) the project mailing list for CoronaSys updates, innovation sheets, and workshop invitations, please send a message to Janina Schäfer (schaefer@a-kfs.de). For general project inquiries, you may contact the team lead Sara Merkes (merkes@a-kfs.de) or the project lead Martin Voss (voss@a-kfs.de).

Previous CoronaSys Innovation Sheets

- 1 "New" Antiviral Face Masks
- 2 " Dyphox" Surface Coating
- 3 MOVES SLC Portable ICU
- 4 Portable TRI- KLEEN 500UV
- 5 Convalescent Plasma Therapy
- 6 ASIC- App
- 7 BinaxNOW Antigen Test
- 8 Corona Traffic Light
- 9 Aproof at Home Antibody Test
- 10 IVAT Hygiene Tower
- 11 LY-CoV555 Antibody Treatment
- 12 4C Mortality Score
- 13 Regional Corona Prediction Model
- 14 Computer-designed Mini- Proteins
- 15 Covid-19 Simulator
- 16 Trimodulin
- 17 BNT162b2-Vaccine
- 18 SARS-COV-2 Rapidplex
- 19 European Corona- Map
- 20 FELUDA Paper Strip Test
- 21 Humanitarian Action Mapping Tool
- 22 IKKA Score
- 23 WHO Digital Implementation Investment Guide
- 24 RCCE Toolkit

All previous CoronaSys Innovation Sheets are available online:

<http://coronasys.a-kfs.de/category/innovation-stream/>

Project lead:

Prof. Dr. Martin Voss

Email: voss@a-kfs.de

Phone: +49 30 838 72613

Website: <http://coronasys.a-kfs.de>



SPONSORED BY THE



Federal Ministry of
Education
and Research

© 2020 ADRU - All rights reserved

The authors are solely responsible for the content of the document. Any commercial use of the documents, including parts and excerpts, is expressly prohibited without prior consultation and permission by the authors.

Citation: Academy of the Disaster Research Unit (2020): Cough- Analysing App. CoronaSys Innovation Sheet 25. Berlin: ADRU.

Akademie der Katastrophenforschungsstelle (AKFS) gGmbH
c/o Katastrophenforschungsstelle
Carl-Heinrich-Becker-Weg 6-10
12165 Berlin