

## Study Information

### Influence of Common Colds on a Speaker's Vocal Characteristics (Einfluss von Erkältungskrankheiten auf die Sprechercharakteristik eines Sprechers)

#### Principal Investigator

#### PD Dr.-Ing. Ingo Siegert

Arbeitsgruppe Mobile Dialogsysteme  
Fakultät für Elektro- und Informationstechnik  
Institut für Informations- und Kommunikationstechnik  
Otto-von-Guericke-Universität Magdeburg  
Universitätsplatz 2  
39106 Magdeburg  
Tel.: +49 391 - 67 50060  
E-Mail: [ingo.siegert@ovgu.de](mailto:ingo.siegert@ovgu.de)

#### Study Center

#### Institut für Informations- und Kommunikationstechnik

Otto-von-Guericke-Universität Magdeburg  
Gebäude 02/03  
Universitätsplatz 2  
39106 Magdeburg

#### Other Involved Parties

#### Dr. Anabell Hacker,

(PostDoc)

#### Jan Hintz, M.Sc und Yamini Sinha, M.Sc.

(Doktoranden)

Fachgebiet Mobile Dialogsysteme (s.o.)

E-Mail: <vorname>.<nachname>@ovgu.de

#### Dear prospective participant,

We cordially invite you to take part in our study. The study is conducted by the Faculty of Electrical Engineering and Information Technology at the University of Magdeburg (Mobile Dialog Systems Group, PD Dr.-Ing. Ingo Siegert).

This study investigates the influence of common colds (Upper Respiratory Tract Infections, URTI) on the characteristics of speech signals and their effects on modern voiceprint-based technologies. In particular, we analyse how short-term changes in the vocal apparatus affect automatic speaker recognition and verification.

Below, we provide information on the aims, benefits, duration, and potential risks associated with participating in this study. Please take your time to read the information carefully. If you have any questions, feel free to contact our study management at any time (see above).

#### Scientific Background of the Study

Voiceprints, also referred to as *speaker embeddings*, are mathematical representations of individual voices that are used, for example, for speaker verification and authentication. Traditionally, **i-vectors** were employed for this purpose, encoding speaker characteristics within a predefined vector space. Today, however, more advanced neural network models such as **x-vectors** and **ECAPA-TDNNs** have become the standard, as they provide more robust and accurate characterizations. These models extract long-term speaker traits while taking into account both temporal and contextual information.

Previous research has primarily focused on technical challenges, such as the robustness of voiceprints under varying recording conditions. Changes to the vocal apparatus due to [Influence of Common Colds on a Speaker's Vocal Characteristics]

factors like aging or acute illness, however, have received far less attention. In particular, the influence of **short-term physiological changes**, such as those caused by common colds, remains largely unexplored.

Upper respiratory tract infections can affect the vocal apparatus in several ways. Common symptoms such as inflammation, swelling of the vocal folds, and increased mucus production can lead to changes in voice quality and pitch. These temporary alterations may impair the performance of automatic speaker recognition systems and reduce the accuracy of voiceprints.

For this study, audio recordings will be collected both **during a cold** and **in a healthy state**, and several additional speaker-related characteristics will be documented. Participation takes place conveniently online, allowing you to submit your speech samples flexibly and without additional effort.

## Objectives of the Study

The aim of this study is to investigate how speech data recorded during and after a common cold affects modern voiceprint technologies such as ECAPA-TDNNs. We seek to determine whether and how these systems can adapt to short-term changes in vocal characteristics. The findings are intended to improve the robustness and practical applicability of such models in everyday use, for example in speaker verification for safety-critical applications.

## Study Population

Approximately 300 participants, recruited on a voluntary basis, are expected to take part in the study.

### *Inclusion criteria:*

- Adults (18 years and older)
- No significant speech or articulation disorders
- Normal functional speech ability
- Informed consent to participate in the study (first item in the questionnaire)

### *Exclusion criteria:*

- Marked impairments in articulation (e.g., slurred or indistinct articulation, fixed braces) or fluency (e.g., stuttering)
- Strong dialectal colouring
- Heavy smoking that affects vocal function
- Other pathologies (including hearing impairments) that affect speech, articulation, or vocal performance

## Study Procedure

### *Data Collection Process*

Participation in the study takes place conveniently online, allowing you to submit your speech samples flexibly and without additional effort. All relevant information and explanations, the

questionnaire, as well as instructions and input fields for the audio recordings are provided online. The entire study procedure can therefore be completed remotely. You will first be shown the study information; only after providing active consent will the questionnaire be unlocked.

At this stage, you will also be asked to provide a contact email address so that we can remind you to complete the second questionnaire and submit the second set of recordings, as well as to coordinate the transfer of the financial compensation.<sup>1</sup>

All data (questionnaires, audio recordings, consent forms, contact information) will be stored securely on our institute's servers for at least 10 years, or until all analyses and publications have been completed. After data collection has concluded, the involved research partners will review potential options for making the dataset available to the research community in an appropriate manner that respects its sensitive nature.

### *Time Commitment*

All data collection, including completing the questionnaire and submitting audio recordings, takes place online at a time of your choosing. Completing the questionnaire takes approximately 5 minutes. Each set of audio recordings is expected to take around 10 minutes.

### **Benefits and Risks of Participation**

You will not receive any direct personal benefit from participating in this study. However, your participation is expected to make an important contribution to research on variations in voiceprints and related investigations into speaker anonymization.

We assess the potential risks associated with participation as minimal. Completing the questionnaire and providing the audio recordings should take no more than about 10 minutes and is therefore not expected to require heightened concentration. You may decide for yourself whether you wish to complete the survey while experiencing a cold; this is entirely your choice. The questionnaire is designed to allow multiple recordings at different times in order to reduce any potential burden. This will also be clearly communicated during the recruitment process.

### **Voluntary Participation**

Participation in this study is voluntary and entirely independent of your studies at OVGU. Choosing not to participate, or withdrawing from the study at any time, will result in no disadvantages for you. You may revoke your consent to participate at any time, without providing reasons and without experiencing any negative consequences. If you withdraw your consent, no further data will be collected; however, the processing of data collected prior to withdrawal remains lawful.

### **Compensation**

---

<sup>1</sup>The contact details cannot be linked to the recordings or questionnaires and are used solely to send a reminder for the second part of the survey and to clarify the arrangements for financial compensation.

Participants who complete both recording sessions (healthy and ill) will receive a compensation of 10 €.

### **Information on the Handling of Study Data**

All data collected, stored, and analysed in the context of this study will be processed in a pseudonymized form in accordance with current data protection regulations (EU General Data Protection Regulation/GDPR and the Data Protection Act of the State of Saxony-Anhalt):

**You are additionally informed here about the rights established in the GDPR (Articles 12 ff. GDPR):**

#### **Legal Basis**

The legal basis for processing your personal data in this study is your voluntary written consent in accordance with the GDPR, as well as the Declaration of Helsinki (the World Medical Association's statement of ethical principles for medical research involving human subjects).

**Regarding your data, you have the following rights (Articles 13 ff. GDPR):**

#### **Right of Access**

You have the right to obtain information about the personal data concerning you that are collected, processed, or, where applicable, transmitted to third parties in the context of the study (including receiving a free copy) (Article 15 GDPR).

#### **Right to Rectification**

You have the right to have inaccurate personal data concerning you corrected (Articles 16 and 19 GDPR).

#### **Right to Erasure**

You have the right to request the deletion of personal data concerning you, for example if the data are no longer required for the purposes for which they were collected (Articles 17 and 19 GDPR).

#### **Right to Restriction of Processing**

Under certain conditions, you have the right to request the restriction of processing, meaning that the data may be stored but not further processed. To exercise this right, please contact the study management or the data protection officer of the study centre (Articles 18 and 19 GDPR).

**In the event of rectification, erasure, or restriction of processing,** all recipients to whom your data have been disclosed will also be notified (Article 17(2) and Article 19 GDPR).

#### **Right to Data Portability**

You have the right to receive the personal data concerning you that you have provided to the controller of the study. You may request that these data be transmitted either to you or, where technically feasible, to another entity designated by you (Article 20 GDPR).

#### **Right to Object**

You have the right to object at any time to specific decisions or measures related to the processing of your personal data (Article 21 GDPR). Such processing will then generally cease.

**Consent to Data Processing and Right to Withdraw Consent**

Your personal data may only be processed lawfully on the basis of your consent (Article 6 GDPR).

You have the right to withdraw your consent to the processing of personal data at any time. However, data collected up to the point of withdrawal may continue to be processed by the entities named in the patient information and consent form for the respective study (Article 7(3) GDPR).

**Notification in Case of a Personal Data Breach (“Data Protection Incidents”)**

If a personal data breach is likely to result in a high risk to your personal rights and freedoms, you will be notified without undue delay (Article 34 GDPR).

**If you wish to exercise any of these rights, please contact** the study management or the data protection officer of your study centre. You also have the **right to lodge a complaint with the supervisory authority or authorities** if you believe that the processing of your personal data violates the GDPR (**see contact details**).

**Data Protection: Contact Details — Study Centre Magdeburg**

Datenschutzbeauftragte/r		Data Protection Supervisory Authority (State Authority of Saxony-Anhalt)	
Name:	Datenschutzbeauftragter der Otto-von-Guericke-Universität Magdeburg	Name:	Der Datenschutzbeauftragte des Landes Sachsen-Anhalt
Address:	Otto-von-Guericke-Universität Magdeburg Datenschutzbeauftragte/r Universitätsplatz 2, D-39106 Magdeburg, Deutschland	Adress:	<i>Visitor Address:</i> Leiterstr. 34a; 39104 Magdeburg <i>Postal Address:</i> Postfach: 1947, 39009 Magdeburg
Phone:	+49-391-67-52499	Phone:	+49-391-81803-0
		Fax:	+49-391-81803-33
Email:	datenschutz@ovgu.de	Email:	poststelle@fd.sachsen-anhalt.de

**For urgent study-related questions, please contact the study management during regular office hours at Tel: 0391/67-50060.**