

# **INFORMATION AND CONSENT FORM**

Title of the study:

**Design of a motivational and personalized recommender system for physical activities: Research of the effect of delivering personalized recommendations for physical activities.**

This is a study carried out by Ghent University. The researchers responsible are:

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## **A. Information about the study**

You are invited to participate in a study of Ghent University. Please take sufficient time to read this information letter carefully before you decide to participate in this study. Do not hesitate to ask the researcher questions if there are any uncertainties or if you would like additional information. Once you have decided to participate in the study, you will be asked to give your explicit consent.

### ***What is the purpose of the research?***

The research group WAVES of Ghent University is conducting research about a recommender system for physical activities. In this second phase of the research, an experimental study will be conducted to study the effect of delivering personalized recommendations for physical activity. We developed our own app “MoveApp” that collects information about its users, by which suggestions for physical activities are automatically generated. Both automatically collected data, such as the weather and the number of steps, and manual data, such as mood and activities, are collected. To protect your privacy, different security measures were taken which are described in this document.

### ***Ethical approval***

This study was approved on the 24<sup>th</sup> of June, 2022 by the Ethics Committee of the Faculty of Psychology and Pedagogical Sciences of Ghent University. Under no circumstances should you consider the approval by the Ethics Committee to be an incentive to participate in this study.

The study is carried out according to the guidelines of the General Ethical Protocol of the Faculty of Psychology and Pedagogical Sciences (Ghent University). The researchers carry out this research in accordance with the accepted standards of scientific and ethical behavior. They adhere to the principles of research integrity as described in "The European Code of Conduct for Research Integrity" (2017, revised edition, ALLEA) and use good research practices.<sup>12</sup>

The research group of this research is WAVES which is integrated in both Ghent University and imec. For this research, Ghent University and imec are joint controllers.

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<sup>1</sup> <https://www.ugent.be/pp/nl/onderzoek/ec#Regelsenprotocollen>

<sup>2</sup> <https://allea.org/code-of-conduct/>

## **B. Information regarding participation**

### ***What does participating in this research entail?***

The app developed for the data collection, MoveApp, will be installed on your Android smartphone (min. Android version 8.0). For eight weeks, you will be asked to open the app every time you performed a physical activity. This can be anything that raises your heart rate from running to cleaning your house to taking the dog for a walk.

The app will also show you a list of suggested physical activities. You can either choose to ignore this, enter your own physical activity in the app, or select one of the suggested activities in the list. This suggested list is automatically generated by the app and is no professional or medical advice, and you do not have to execute them. Whether you decided to execute or ignore the suggestions, you will be asked to provide feedback on the suggestions, e.g. why a certain suggestion did not suit you, or how much you liked the suggestion, and to fill in your mood and details of the activity using simple buttons in the app.

After first installing the app, the first questionnaire will be asked. Every week, another questionnaire will be shown in the app as well. After 8 weeks, a last questionnaire will be provided. Then, you can choose to continue to use the app or to delete the app from your device. If you decide to continue, a follow-up questionnaire will be shown after six months. For every questionnaire you answer, the compensation money for you will increase (more explanation about the compensation below).

A comprehensive guide with screenshots for the installation and an instruction video for the operation of the app will be provided to you on the website <https://moveapp.ugent.be/>.

Participation in this study is entirely voluntary and there can be no coercion in any way. You do not have to execute the activities suggested in the app. You can only participate if you are 18 years or older and younger than 65 years. Using this app is only allowed if you honestly answered 'no' to all the health questions in the screening questionnaire.

You can refuse to participate in the study and you can withdraw from the study at any time during the study without having to provide a reason for doing so. If you refuse to participate, or if you decide to withdraw from the ongoing study, this will in no way affect your further relationship with the researcher. This document, the instruction manual and video of the app explain how to exercise your "right to be forgotten" and how to withdraw your consent. To protect your privacy, follow these steps before the deadline date (communicated on the website <https://moveapp.ugent.be/#details>) and before deleting the app from your device. You don't have to notify the researchers about your decision because your data will be deleted automatically. After that deadline, no new data can be submitted and no data present inside the research dataset can be deleted.

If you wish, you can get a summary of the research findings after the study has been completed and the results are known. To receive a summary, you can contact the researcher you are in contact with.

### ***What are the risks and benefits of participating in this study?***

There is no known permanent risk associated with this study. The app was developed to collect data and automatically generate a list of suggestions for physical activities. This list is a suggestion and not medical or professional advice. Users of MoveApp can always choose to ignore these suggestions. Do

not rely on the generated suggestions in this app to start engaging in the suggested physical activity. Never rely on the suggestions in place of seeking professional medical advice. You must consult a doctor before engaging in physical activity when you failed the medical health screening questions (one or more times 'yes' as the answer), and you cannot use this app in that case.

The app is not designed to and does not provide medical advice, professional diagnosis, opinion, treatment or services to you or to any other individual. Through this app, Ghent University collects subjective medical information for research purposes only. The submission in this app of your subjective medical information for both physical and mental health is not a substitute for medical or professional care, and you should not use the app in place of a visit, call consultation or the advice of your physician or other healthcare provider.

To protect your privacy, the collected data are pseudonymized and encrypted. For more information, see below under "detailed explanation of the processing of your data".

### ***Is there an incentive for participating in this research?***

There is an incentive provided. In order to receive the incentive, you have to take the study seriously by submitting data about your performed physical activities in the app for eight weeks, fill in the questionnaires and enter your email address in the app. For every questionnaire you have answered, the amount of money you can earn will increase. The most important questionnaire is the post-test questionnaire that will appear in the app after 8 weeks. You can only qualify for the incentive if you have correctly filled in this post-test questionnaire. Several checks are programmed to define whether or not you carefully filled in the questions and qualify for the incentive (see the details on <https://moveapp.ugent.be/#incentive>). The amount of physical activity you performed is not measured to qualify for the incentive.

Since we designed this app compliant to the GDPR, we never link your email address to the data collected by the app. Therefore, if you want to receive the compensation money, you have to enter your email address after filling in each questionnaire. This email address will be encrypted and sent to our separate incentive database, together with a (non-identifiable) description of how well you filled in the questionnaires (to be able to determine whether or not you qualify for the incentive). This encrypted email address will be saved separately from the research data, will never be linked to the secret user ID and will only be decrypted if you qualify to receive the compensation. More details about the incentive and its conditions can be found on the website <https://moveapp.ugent.be/#incentive>.

Your participation in this study not only helps us, but can also help yourself to gain more insight in your physical activity.

## **C. Information regarding Privacy and Personal Data**

The legal framework for the processing of personal data and confidential information in the context of this study is determined by:

- The European General Data Protection Regulation 2016/679 of 27 April 2016, which has been active since 25 May 2018 (this is the GDPR);

- The Belgian Law on the Protection of Natural Persons with regard to the processing of personal data of 30 July 2018

The researchers must comply with the generic code of conduct for the processing of personal data of Ghent University.<sup>3</sup>

### ***What personal data is collected?***

The following personal data and special categories of personal data will be processed using the installed app MoveApp. You have control over the data that the app sends to the online research database. Further explanations can be found below or in the manual and instruction video for the operation of the app.

- Age (four ranges of age groups will be presented, no specific birth year will be asked)
- BMI
- Personal life goals
- Medical screening health questionnaire
- Data relating to the participant's location during the study (derived traveled distance, location type and weather)  
→ location coordinates themselves are never saved, but only used to derive these other data
- Data relating to the participant's step count during the study
- Data relating to the participant's physical activities during the study
- Data relating to the participant's feedback on the activity and/or suggestions for physical activity
- Data relating to the participant's mood during the study
- Data relating to the participant's motivation for physical activity
- Data relating to the participant's experience with the app and perceived quality of the recommendations

The app provides a hyperlink to a YouTube search page when you click on the YouTube button provided in the app. YouTube and other external website might collect cookies. More information about cookies can be found in our Cookie Policy <https://moveapp.ugent.be/CookiePolicy.pdf>.

In order to answer your emails in case you have questions, to send you the results of the study when this is finished if you subscribed for this or to send you the email with the compensation for you participation, your email address and name will also be processed. When submitting your email address in MoveApp to subscribe to receive the incentive, this email address will be encrypted locally and only decrypted to send you the email with your incentive if you qualify for it. Your email address, either encrypted or unencrypted, will never be linked to the research data submitted through MoveApp.

### **Detailed explanation of the processing of your data:**

The app you have installed on your Android smartphone will use the sensors present in the device. The built-in accelerometer records the number of steps you have taken. The GPS collects data about

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<sup>3</sup> <https://www.ugent.be/nl/univgent/privacy/gedragscode-persoonsgegevens.htm>

your location in order to calculate the traveled distance and request the current weather at that location and the location type (e.g. building, park, public transport).

Only when you click “Submit” on the main screen, the manually entered data will be sent to the database. The automatically collected data on the other hand, such as the weather and location type at your location and your daily step count, will be sent to the database every hour (this never contains the location coordinates, only the derived weather, location type, traveled distance and step count).

Before being sent to the database, all the data will be encrypted locally. This means that the online database never contains any unencrypted data and that the data can only be decrypted with the password by the researchers. Along with your encrypted data, your secret user ID is sent to the database. This secret user ID was generated and saved locally on your device the first time you opened the app and has no connection to your name or email address, and only to your submitted research data in MoveApp. Because this secret user ID is only known to your device, there is no way to link your research data in the database to your email address and it is not possible to email the researchers to ask us to access, edit or delete your submitted data in the database. It is, however, possible to delete all your previously submitted data in the research database but this can only be done through MoveApp installed on your smartphone because this has access to your secret user ID. To do this, please refer to the instruction manual or video and do this before the deadline date communicated to you on the website <https://moveapp.ugent.be/>.

### ***Why is this personal data collected?***

Since this research is about health, it is important to collect data such as the BMI and the activities of that day. As mentioned earlier, these healthy activities of the day will be linked to your mood and context (which is based on your location). By submitting daily data about your context, activities and mood, the system can automatically generate suggestions for physical activity. The goal is to develop a motivational and personalized recommender system to improve both the physical and mental health of the users in a sustainable way.

### ***On what legal basis is the data processed?***

#### **1. Processing of personal data in MoveApp**

We process your personal data for this purpose based on your explicit consent to participate to the study. Your explicit consent will be requested in MoveApp itself after reading this Information and Consent Form. Participants have the right to withdraw their consent at any time at a later stage but this has to be done in the app and before the deadline date. More information can be found in the Privacy Policy and instruction manual.

## 2. Processing of personal data in the email communication

In order to answer your questions if you would have any, send your compensation to you or send the results of the study to you if you would be interested, we need to process your email address in function of the follow-up and assistance of the research. Should you decide to participate, your email address is in no way linked to the research data you submitted or will submit during the study in the app. We process your personal data only for this purpose based on your consent to handle your questions and requests in the best possible way and to communicate with you. This consent for email communication may be revoked at any time by reporting this to the main researcher via [ine.coppens@ugent.be](mailto:ine.coppens@ugent.be).

### ***Who has access to my (personal) data?***

The research data of all participants are pseudonymized. There is no link between your email address for email communication and the data in the research database. The research data you submit through MoveApp will be encrypted (using AES-256 bit encryption) locally on your device before they are sent to an online database.

For this online database, the services of Google named “Firebase Realtime Database” and “Firebase Authentication” are used. Because the data are encrypted before it arrives in the Realtime Database, Google never has access to your unencrypted data. The decryption of the data can only happen when the online database is downloaded on a work computer of the WAVES research group using the encryption password. The location of the servers of the Realtime Database are chosen in Belgium to conform to the GDPR. To grant your device access to the Realtime Database, Authentication uses your IP address but this is in no way linked to your secret user ID or other the research data. A data processing agreement with Authentication is in place as a safeguard. More information can be found in the Privacy Policy.

The services OpenWeatherMap and OpenCage are used to receive the weather at your location and the location type. Using OpenCage, the “no\_record” option is set to 1 which assures no record is kept from the query with your coordinates. Using OpenWeatherMap, only two decimals of the longitude and latitude are provided in the query to reduce the accuracy of your location and protect your privacy.

After the study deadline, the encrypted database will be downloaded from Firebase’s Realtime Database on the work computer of WAVES and saved on the backup servers of UGent, both of which are protected with a password and can only be accessed by the researchers of the WAVES research group at Ghent University. Only research group WAVES has the password needed for decryption. The data in the Realtime Database will also be deleted from Firebase’s servers once the study is finished and once the study dataset is present on the servers of WAVES. The research data are encrypted when stored on WAVES’ servers during the research, for which Ine Coppens ([ine.coppens@ugent.be](mailto:ine.coppens@ugent.be)) is responsible, and for at least five years after the research, for which prof. dr. ir. Toon De Pessemier ([toon.depessemier@ugent.be](mailto:toon.depessemier@ugent.be)) is responsible. If these data were to be shared, they will be encrypted to ensure the confidentiality of the personal data. The email addresses for email communication will be deleted as soon as the study is finished and email communication is no longer necessary.

### ***Re-use of data***

The research data collected here can also be useful in answering other research questions. Therefore, there is a possibility that the research data will be reused at a later date for other research. The reuse of the research data can be done both within the own research team, as well as by external researchers inside and outside the European Union. To this end, the research data will be made available in a controlled manner via a dedicated share platform for research data. All necessary measures are taken to ensure the confidentiality of your personal data as prescribed in the UGent Generic Code of Conduct for the handling of personal data and confidential information.

### ***What rights do you have as a participant with regard to your personal data?***

In accordance with European and Belgian privacy legislation, your privacy is respected. As already indicated, you can withdraw your consent at any given time without giving any reason. The withdrawal of your consent does not affect the validity of the data already collected. This means that your data will not be processed further from the moment of withdrawal, provided that you exercised your right to be forgotten before the deadline date.

Since your data is sent to the online database with each submit with the secret user ID that is only accessible to your device and not for the researchers, it is not possible to distinguish your data from the data of others in the database. This means that it is not possible to request a copy of your collected data, modify it or delete certain data points from the database afterwards.

However, before submitting you always have the possibility to review and edit your manually entered data in the app itself. The automatically collected data on the other hand (weather, location type, traveled distance and step count), cannot be reviewed or edited, and is sent in its encrypted form to the online database every hour. These automatic data never contain your location coordinates. You can stop this automatic data collection at any times by denying the location and activity permissions in the app's settings on your smartphone. You can also decide at any time to stop submitting your data in the app and remove the app from your device.

It is also possible to completely stop the study at any time during the research and delete all your previously submitted data (both your manually entered and the automatically collected data) by selecting this in the app while the app is still installed on your device and still has access to this secret user ID. This would be the case when you would want to withdraw your explicit consent and you want to exercise your right to be forgotten. In this case, do not forget to do the actions for deletion in the app before uninstalling the app from your device (since only the app has access to your secret user ID) and before the deadline date communicated to you on the website <https://moveapp.ugent.be/>. After this, you can remove the app from your device and you don't have to contact the researcher for your decision. Your consent will automatically be withdrawn because none of your data will be present anymore in the database. These actions are all clearly explained in the manual and instruction video of the app.

### ***Medical disclaimer***

The app is not designed to and does not provide medical advice, professional diagnosis, opinion, treatment or services to you or to any other individual. MoveApp generates a list of suggested physical activities, which the user does not have to execute. This list is a suggestion and not medical or professional advice. Users of MoveApp can always choose to ignore these suggestions. Do not rely

on the generated suggestions in this app to start engaging in the suggested physical activity. Never rely on the suggestions in place of seeking professional medical advice. You must consult a doctor before engaging in physical activity when you failed the medical health screening questions (one or more times 'yes' as the answer), and you cannot use this app in that case.

Through the app, Ghent University collects subjective medical information for research purposes only. The submission of your subjective medical information in the app is not a substitute for medical or professional care, and you should not use the app in place of a visit, call consultation or the advice of your qualified and licensed physician or other healthcare provider. Ghent University is not liable or responsible for any advice, course of treatment, diagnosis or any other information, services or product for the subjective medical data you submitted in the app. Submitting subjective medical information, both physical and mental, in MoveApp does not establish a doctor–patient relationship.

If you believe you have any health problem, or if you have any questions regarding your health or a medical condition, you should promptly consult your physician or other healthcare provider. Never disregard medical or professional advice, or delay seeking it, because of something you entered in this app. Never rely on information submission in this app in place of seeking professional medical advice. You should also ask your physician or other healthcare provider to assist you in interpreting any information in this app or in applying the information to your individual case. We respect your privacy and we will not take the initiative ourselves for contacting medical help.

### ***The legal documents***

When the app is opened for the first time, it will show the Terms of Use, Privacy Policy, Cookie Policy and this Information and Consent form. You have to agree to the Terms of Use, indicate you have read the Privacy Policy and Cookie Policy and give your explicit consent to all the listed items when you want to participate in the research and have access to the app.

You can always re-read the Terms of Use, Privacy Policy, Cookie Policy and this Information and Consent form in the app itself in the Information Page (explained in the instruction manual) or on the website <https://moveapp.ugent.be/>. Other legal documents can be requested by emailing us.

### ***How can I file a complaint?***

If you wish to file a complaint about the way in which your personal data are treated or if you have any questions regarding your personal data in the context of this study, you can contact the Data Protection Officer of Ghent University via [privacy@ugent.be](mailto:privacy@ugent.be) or 09 264 95 17.

You can also file a complaint to the Data Protection Authority, Drukpersstraat 35, 1000 Brussels (email: [contact@apd-gba.be](mailto:contact@apd-gba.be)) and/or the Flemish Supervisory Committee (email: [contact@toezichtscommissie.be](mailto:contact@toezichtscommissie.be)).



## A. Permission with regard to participation in the study

I voluntarily participate in this scientific study and give permission to the researchers to process, store, analyze and report my data.

I know that I can withdraw from the study at any time during the study without giving a reason for this decision and without affecting my further relationship in any way with the researcher.

I have read the information form and have been given sufficient explanation of the nature, purpose, duration, and anticipated effects of the study. I was given the opportunity to ask questions and I received a satisfactory answer to all my questions.

I know that the specific incentive and its conditions are listed on the website and that I can only qualify for the incentive when I follow these and enter my email address, which will be connected to a description of the conditions that I did and/or did not follow, for the researchers to check whether or not I qualify.

I know that the generated list of suggestions for physical activities is automatically generated by a computer, and that these are not professional or medical advice. I know that I do not have to execute these suggested activities, and that they are just a suggestion.

## B. Consent with regard to the processing of personal data

I have read the information form and I know that I have rights to protect my privacy (including the right to be forgotten) and what I should do to exercise these rights and that I should do this before the **deadline date** specified on the website: <https://moveapp.ugent.be/>.

I give permission to the researchers to collect, process and store (personal) data of me for the purposes of this study.

I am aware that the app will send automatically collected contextual data (no location coordinates, only weather, location type, traveled distance and step count) to the research database every hour to provide context-aware recommendations when I allow the app's location and activity permissions, and that I can deny these permissions at any time.

I know that clicking on links in the app such as the YouTube button will guide me to other websites that might collect cookies. Further information can be found here: <https://moveapp.ugent.be/CookiePolicy.pdf>

## C. Consent with regard to the reuse and sharing of data

I give permission to **reuse** my data for further scientific research outside the framework of the current study.

I give permission to the researchers to **share** my data for further scientific research, with researchers inside and outside the **EEA**. All necessary measures are taken to protect the confidentiality of my personal data.

Participant (no name needed)	Name of researcher: Ine Coppens
Date: (date of app installation)	Date: 19/09/2022
I give my explicit consent for <b>all</b> the items listed above in this Information and Consent Form Yes <input type="checkbox"/> No <input type="checkbox"/>	

This Information and Consent form will be shown in MoveApp. The app will then provide one check box where the participant indicates his or her explicit consent for all the boxes mentioned above. Only when the participant gives his or her explicit consent for all the points, he or she will be granted access to the app. This way, no name or signatures of the participants have to be collected on paper while the researchers can still be certain that the participant who uses the app, gave his or her full explicit consent.