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Consent to Take Part in a Research Study

Title of research study: *Safety Impacts of Human-ADS Team Driving Applications for CMVs (IRB #23-238)*

Principal Investigator: Matthew Camden, mcamden@vtti.vt.edu, 540-231-1503

Other Study Contacts: Andrew Krum, akrum@vtti.vt.edu, 540-231-0353

Key Information: The following is a short summary of this study to help you decide whether to be a part of this study. More detailed information is listed later in this form.

Why am I being invited to take part in a research study?

We invite you to take part in this research study because you are 21 years of age or older and have a Class A or Class B CDL.

What should I know about being in a research study?

- Someone will explain this research study to you.
- Participation is optional.
- The video, other data, and additional information that could be used to identify you will be held under a high level of security.
- Your data will not be linked to your name or identity.
- If you decide to take part, you are always free to change your mind and exit the study at any point without penalty.
- You are welcome to ask all the questions you want before you decide.

Why is this research being done?

This simulator study seeks to understand situations where a human will team with an automated commercial motor vehicle (CMV). This research will evaluate the safety of these driver-automated CMV teams. Data from this study will be used in a confidential way to understand automated driving systems in CMVs.

How long will the research last?

Participation in the study will last a total of 17 hours.

What will I need to do if I choose to participate?

If you choose to participate, you will need to do the following:

1. Come to VTTI in Blacksburg, Virginia for one 17-hour session, including extended breaks.
2. Complete several questionnaires that will gather information about you, your driving history, and your thoughts on different in-vehicle technologies.

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3. “Drive” in a driving simulator while teaming with an automated CMV.
4. Let the experimenter know if you begin to experience any nausea, dizziness, or other symptoms that sometimes occur when driving in a simulator.
5. Agree to have VTTI pick you up and take you home, or pay for a rideshare if you live within 30 miles of VTTI, or agree to have VTTI pay for one night in a local hotel if you live more than 30 miles away from VTTI (we will pick you up and drop you off from the hotel and transport you to VTTI). Due to the extended participation time, we will not allow participants to drive themselves home after the study, for safety reasons.

Is there any way being in this study could be bad for me?

You may experience symptoms of “simulator sickness” including dizziness and nausea. More detailed information about the risks of this study can be found under *“Is there any way being in this study could be bad for me? (Detailed Risks)”*.

Will being in this study help me in any way?

There are no benefits to you from taking part in this research.

What happens if I do not want to be in this research?

Taking part in this research is completely up to you. You can decide to participate or not to participate.

Detailed Information: The following is more detailed information about this study in addition to the information listed above.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to Matt Camden at (540) 231-1503 or email him at: mcamden@vtti.vt.edu

This research has been reviewed and approved by the Virginia Tech Institutional Review Board (IRB). You may communicate with them at 540-231-3732 or irb@vt.edu if:

- You have questions about your rights as a research subject
- Your questions, concerns, or complaints are not being answered by the research team
- You cannot reach the research team
- You want to talk to someone besides the research team to provide feedback about this research

How many people will be studied?

We plan to include about 80 people in this research study.

What happens if I say yes, I want to be in this research?

If you agree to participate in this study, you will be asked to come to VTTI to participate in a 17-hour session. During this session you will:

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1. Read and sign this Informed Consent Form.
2. Fill out a W9 form for compensation purposes.
3. Complete a Pre-Study Demographics questionnaire, Perceptions of Technology & Vehicle ADS questionnaire, and Pre-Study Driver Behavior questionnaire.
4. Complete a Psycho-motor vigilance test (PVT) that requires you to use a VTTI tablet and tap the screen when you see a counter appear at random intervals during a 3-minute test. This test measures your reaction time.
5. Complete a short training on the driving simulator. After which you will complete a motion sickness questionnaire to understand how the simulator affects you.
6. “Drive” in the simulator for approximately 16 hours where you will transition from being in control of the CMV to allowing the automated CMV to be in control. These transitions will occur every 2 to 4 hours. You will be asked to complete another PVT test each time you transition.
7. You will be allowed to leave the driver’s seat while the automated CMV is in control. You will be allowed to read, eat, look at your phone, watch TV, etc. when the automated CMV is in control. You will not be allowed to leave the building.
8. The researcher will routinely ask you if you are experiencing any symptoms of Simulator Sickness. You can also alert the researcher should you begin to be aware of symptoms.
9. Complete a post-study ADS experience & perceptions questionnaire.

What happens if I say yes, but I change my mind later?

You can leave the research at any time, for any reason, and it will not be held against you.

If you decide to leave the research, let the researcher know so that they can compensate you for your participation up to the time of withdrawal.

You are also free to not answer any questions that you choose without penalty.

If you are experiencing symptoms of simulator sickness, we will ask you to stay at VTTI until you are symptom free for 20 minutes.

Is there any way being in this study could be bad for me? (Detailed Risks)

There are some minor risks and discomforts to which you may be exposed to in volunteering for this research. These risks include:

1. Possible discomfort associated with Simulator Sickness. Symptoms may include fatigue, headache, eye strain, difficulty focusing, increased salivation, dry mouth, sweating, nausea, difficulty concentrating, fullness of head, blurred vision, dizziness, vertigo, nausea and upset stomach. This is similar to what someone may experience after riding an amusement park ride or when using virtual reality headsets.
2. The risk of completing the questionnaires is like completing office paperwork. However, there is also risk associated with disclosing illegal behavior on two of the questionnaires.
3. Due to the length of the sessions, you may become fatigued.

The following precautions will be taken to ensure minimal risk to the participants:

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1. You will be driving in a simulator instead of live traffic situations to prevent harm from crashes or other hazards while driving.
2. You will be given breaks from the driving simulator to ensure minimum discomfort. You will be allowed to stop the simulator session at any time if you feel physical discomfort.
3. If you begin to experience symptoms of simulator sickness, you will be monitored by an experimenter until you have been symptom free for 20 minutes and can leave VTTI.
4. You may stop participating in the study at any time. You may also choose to skip questions on the questionnaires.
5. If you live within 30 miles of VTTI, you will be required to accept a ride to and from VTTI. If you live further than 30 miles of VTTI, you will be offered a local hotel room for one night and a ride to and from the hotel.

What Information and Data Will Be Collected?

INFORMATION

1. **Contact information** includes your name, address, email address, phone numbers, and similar information used to contact you when needed. It will be stored securely in electronic form during the study and destroyed one year after the study is complete. This information will not be used in any research or analysis.
2. **Auxiliary study information** includes your Social Security Number and information that you provide on the W9 form. Virginia Tech requires this to compensate you for your participation. This information will not be linked to your study data and will not be used in any research or analysis.

DATA (Used for Research)

1. **Driver data** includes your answers to the questionnaires and the PVT. These data will not contain your name or any identifying information and will be used in analyses, both on their own and in combination with the driving data. These data will be stored securely in electronic form indefinitely.
2. **Driving and eye tracking data** includes the data we collect from the simulator and eye tracking device while you are “driving”, including video data, and sensor data. This information will contain video of your face. These data will be stored securely in electronic form indefinitely.

How Information and Data are Collected

The simulator will capture data on your driving as well as video of the screens and you as a driver. Similarly, eye tracking data will be collected via a small camera in the simulator. Questionnaires and PVT will be collected electronically using a VTTI tablet.

What happens to the information collected for the research?

We will make every effort to limit the use and disclosure of your personal information, including research study records, only to people who have a need to review this information. We cannot promise complete confidentiality. Organizations that may inspect and copy your information include the IRB, Human Research Protection Program, and other authorized representatives of Virginia Tech.

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We will separate your private information from data that are collected during this research; de-identified data (which cannot be associated with your identity) could be used for future research studies or distributed to another investigator for future research studies without your additional informed consent.

We expect the driver data and driving data from this study to be useful for many years after the study is over, therefore, we plan to keep and use it indefinitely. It is expected that other researchers beyond the original study team identified in this form as well as industry partners may also find the data and results of this study useful. We will allow these individuals to use the data under the following conditions:

1. **Data containing Personally Identifying Information (PII):** These data contain information that could be used to personally identify you. Examples of PII are images of your face. PII will not be released outside the research team. However, other researchers may be granted temporary access to the data in a secure environment.
 - a. VTTI researchers wishing to use data containing PII will be required to submit proof of IRB approval. These researchers will only be allowed access to view these data in a secure environment.
 - b. Researchers outside VTTI will be required to submit proof of IRB approval and sign a data use license assuring that they will extend the same privacy protections to your PII that are outlined in this form. These researchers will only be allowed to access these data in a secure environment or in adherence with National Institutes of Health (NIH) guidelines.
2. **Data not containing PII:** These data do not contain any information that could be used to personally identify you.
 - a. VTTI researchers will have access to this data.
 - b. Researchers outside VTTI may use data that does not contain PII after they sign a data use license.
 - c. This data may also be posted online for public use in the future.

The results of this research study may be presented in summary form at conferences, in presentations, reports to the sponsor, and academic papers. Additionally, video collected during your study session may be included in presentations at conferences. Videos used in presentations will not contain any information that can be used to identify you. A variety of technologies will be used to blur your face, replace it with it with an avatar, remove or distort audio, etc.

Can I be removed from the research without my, OK?

The person in charge of the research study or the sponsor can remove you from the research study without your approval. Possible reasons for removal include the research sponsor deciding to suspend or cancel the study, uncooperative behavior, or you experience symptoms of simulator sickness.

What else do I need to know?

This research is being funded by the Federal Motor Carrier and Safety Administration (FMCSA).

Any expenses accrued for seeking or receiving medical or mental health treatment will be your responsibility and not that of the research project, research team, or Virginia Tech.

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If you agree to take part in this research study, we will provide you with \$975 at the end of the session. If you withdraw from the study in the middle of a session, you will be compensated for the time you participated at the pro-rated rate of \$50 per hour.

Compensation is provided via a prepaid MasterCard. Please allow one full business day for the MasterCard to be activated. Once activated, this card cannot be used past its expiration date. As stated in the ClinCard FAQ documentation you receive, the issuing bank will begin subtracting a monthly service fee of \$4.50 after three months of inactivity.

Signature Block for Capable Adult

Your signature documents your permission to take part in this research. We will provide you with a signed copy of this form for your records.

Signature of subject

Date

Printed name of subject

Signature of researcher obtaining consent

Date

Printed name of researcher obtaining consent