Delft University of Technology
ETHICS REVIEW CHECKLIST FOR HUMAN RESEARCH
(Version 10.10.2017)

This checklist should be completed for every research study that involves human participants and should be submitted before potential participants are approached to take part in your research study.

In this checklist we will ask for additional information if need be. Please attach this as an Annex to the application.

Please upload the documents (go to this page for instructions).

Thank you and please check our website for guidelines, forms, best practices, meeting dates of the HREC, etc.

I. Basic Data

Project title:	**Protocol for communication between manned and unmanned ships**
Name(s) of researcher(s):	**Ingmar Wever**
Research period (planning)	**September 2017-October 2018**
E-mail contact person	**i.wever@student.tudelft.nl**
Faculty/Dept.	**EEMCS – Interactive Intelligence**
Position researcher(s):[1]	**Master student**
Name of supervisor (if applicable):	**Mark Neerincx**
Role of supervisor (if applicable):	**Professor**

II. A) Summary Research

In the last few years, there has been many projects on the development of autonomous vessels. So far, no research has been conducted on the protocol needed for communication between manned and unmanned vessels. This study will design and test such a protocol, based on existing protocols and systems, and human factors requirements. The protocol aims at safe navigation, while manned and unmanned vessels encounter each other. The research questions of the evaluation are:

1. Usability: Is the protocol effective (accurate and complete exchange of required information) and efficient (minimal effort and time)? Is operator's satisfaction with and trust in the system high?
2. Situation awareness: Do the operator and the unmanned vessel have the required situation awareness for safe navigation?
3. Performance: Is the Closest Point of Approach (CPA) above threshold and the travel time acceptable?

About 10 experienced seafarers will participate in the evaluation (all having sufficient experience as seafarer to represent other captains), and perform several navigation scenarios with a simulator. On a computer screen, the maritime situation is shown (map showing speed, course and location of ships). The participant will have to take actions, such as change speed, change course or engage in communication and answering several questions throughout the experiment, this is all related to the protocol. Usability, situation awareness and performance measures are acquired from the log-files (e.g. time), observation (e.g., verbal expressions) and questionnaires (e.g., trust).

B) Risk assessment

Please indicate if you expect any potential risks for the participants as a result of your research and, if so, how you will try to minimize these, also consider personal data.

[1] For example: student, PhD, post-doc

The only personal data which will be stored is a summary of the experience of the attendee. By making it anonymous no link can be made and thus is the risk mitigated.

III. Checklist

Question	Yes	No
1. Does the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g., children, people with learning difficulties, patients, people receiving counselling, people living in care or nursing homes, people recruited through self-help groups).		X
2. Are the participants, outside the context of the research, in a dependent or subordinate position to the investigator (such as own children or own students)?[2]		X
3. Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g., covert observation of people in non-public places).		X
4. Will the study involve actively deceiving the participants? (e.g., will participants be deliberately falsely informed, will information be withheld from them or will they be misled in such a way that they are likely to object or show unease when debriefed about the study).		X
5. Personal data • Will the study involve discussion or collection of personal data? (e.g., BSN number, location, sexual activity, drug use, mental health). Please check the following definition (here link to data stewards website).		X
If yes': Did the data steward approve your data management plan? (Electronic Consent)		X
6. Will drugs, placebos, or other substances (e.g., drinks, foods, food or drink constituents, dietary supplements) be administered to the study participants?		X
7. Will blood or tissue samples be obtained from participants?		X
8. Is pain or more than mild discomfort likely to result from the study?		X
9. Does the study risk causing psychological stress or anxiety or other harm or negative consequences beyond that normally encountered by the participants in their life outside research?		X
10. Will financial inducement (other than reasonable expenses and compensation for time) be offered to participants?		X
Important: if you answered 'yes' to any of the questions mentioned above, please submit a full application to HREC (see: website for forms or examples).		
11. Will the experiment collect and store videos, pictures, or other identifiable data of human subjects? [3]	X	

[2] **Important note concerning questions 1 and 2.** Some intended studies involve research subjects who are particularly vulnerable or unable to give informed consent .Research involving participants who are in a dependent or unequal relationship with the researcher or research supervisor (e.g., the researcher's or research supervisor's students or staff) may also be regarded as a vulnerable group . If your study involves such participants, it is essential that you safeguard against possible adverse consequences of this situation (e.g., allowing a student's failure to complete their participation to your satisfaction to affect your evaluation of their coursework). This can be achieved by ensuring that participants remain anonymous to the individuals concerned (e.g., you do not seek names of students taking part in your study). If such safeguards are in place, or the research does not involve other potentially vulnerable groups or individuals unable to give informed consent, it is appropriate to check the NO box for questions 1 and 2. Please describe corresponding safeguards in the summary field.

[3] Note: you have to ensure that collected data is safeguarded physically and will not be accessible to anyone outside the study. Furthermore, the data has to be de-identified if possible and has to be destroyed after a

Question	Yes	No
If "yes", please fill in Annex 1 and make you sure you follow all requirements of the applicable data protection legislation. In addition, please provide proof by sending us a copy of the informed consent form.		
12. Will the experiment involve the use of devices that are not 'CE' certified? *Only, if 'yes': continue with the following questions:*		X
➢ Was the device built in-house?		
➢ Was it inspected by a safety expert at TU Delft? (*Please provide device report, see: HREC website)*		
➢ If it was not built in house and not CE-certified, was it inspected by some other, qualified authority in safety and approved? *(Please provide records of the inspection).*		
13. Has or will this research be submitted to a research ethics committee other than this one? (*if so, please provide details and a copy of the approval or submission).*		X

IV. Enclosures (tick if applicable)

- Informed consent form (if 'yes' to question 11)

V. Signature(s

Signature(s) of researcher(s)
Date: 22 Augustus 2018

(I. Wever)

Signature (or upload Electronic Consent) research supervisor (if applicable)

Date: 22 Augustus 2018

(prof.dr. M.A. Neerincx)

scientifically appropriate period of time. Also ask explicitly for consent if anonymised data will be published as open data.

Appendix1: Privacy and data protection

Please fill this in if you have answered ‘ yes’ to question 11 in the checklist

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a. Will the participants have access to their own data? If no, please explain.

Yes.

b. Will covert methods be used? *(e.g. participants are filmed without them knowing)*

No.

c. Will any human tissue and/or biological samples be collected? *(e.g. urine)*

No.

Toestemmings verklaring formulier

Project titel:	**Protocol for communication between manned and unmanned ships**
Naam onderzoeker:	**Ingmar Wever**
Onderzoeks periode:	**September 2017-October 2018**
E-mail contact persoon:	**i.wever@student.tudelft.nl**
Faculteit en afdeling:	**EEMCS – Interactive Intelligence**
Positie onderzoeker:	**Master student TU Delft**
Naam begeleider:	**Mark Neerincx**
Rol begeleider:	**Professor Interactive Intelligence**

In de laatste jaren is er veel onderzoek naar autonome schepen. Echter wordt er nog weinig gekeken naar de communicatie tussen bemande en onbemande schepen. De bedoeling van dit experiment is het aantonen van het belang van een protocol voor deze communicatie. Dit protocol zal gebaseerd zijn op bestaande systemen en protocollen. Hierbij wordt dan ook antwoord gegeven op de volgende vraag:

> *Will a protocol based on existing maritime systems and communication protocols ensure safe navigation while manned and unmanned vessels encounter each other?*

Hierbij wordt gekeken naar het vertrouwen in een dergelijk protocol, de "situation awareness" en hoe tevreden zeevaarders hiermee zijn. Dit is afhankelijk van hoe goed en gemakkelijk het systeem te gebruiken is.
Tijdens het experiment zullen veelvoorkomende situaties getoond worden. Het is aan u (de deelnemer) om beslissingen te nemen zoals het veranderen van de koers, snelheid en het aangaan van communicatie. Tijdens het experiment kunnen foto's en geluidsopnamen worden gemaakt, daarnaast wordt u gevraagd om verschillende vragen te beantwoorden. Dit zal worden geanonimiseerd en alleen worden gebruikt voor het verwerken. Conclusies in gepubliceerde teksten zullen niet worden gebaseerd op de individuele resultaten.
Voor zover bekend zijn er geen risico's aan het deelnemen aan dit experiment. U bent vrij om geen antwoord te geven op elk of alle gestelde vragen. Daarnaast kunt u te allen tijde uw deelname stoppen.

Mocht u vragen hebben tijdens het experiment, of nadelige effecten ondervinden als resultaat van de studie geef dit dan te allen tijde aan. Uw deelname is vrijwillig, u mag dus zelf kiezen om wel of niet mee te doen aan dit onderzoek. Wanneer u deelneemt aan dit onderzoek wordt u vriendelijk verzocht om dit formulier te ondertekenen. Na ondertekenen bent u nog steeds vrij om te stoppen op ieder moment, ook zonder het opgeven van een reden. Terugtrekken uit deze studie zal geen invloed hebben op de relatie met de onderzoeker. Mocht u zich terugtrekken, zullen waar mogelijk uw gegevens worden teruggeven en verwijderd.

Toestemming

Ik heb de bovenstaande informatie gelezen en begrepen, daarnaast heb ik de mogelijkheid gehad om vragen te stellen. Ik begrijp dat mijn deelname vrijwillig is en mij op ieder moment kan terugtrekken. Daarnaast begrijp ik dat ik een digitale kopie krijg van dit toestemmingsformulier. Ik kies vrijwillig om mee te doen aan dit onderzoek.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____