University of Essex

Participant Information Sheet

Project Proposal: Human v AI in Classifying Marker Buoys

Principal Investigator: Richard Lay-Flurrie
School: School of Computer Science and Electronic Engineering
Institution: University of Essex

Please read this information carefully before deciding whether to take part.

University of Essex

Participant Information Sheet

Invitation

My name is Richard Lay-Flurrie and I am a PhD student in the School of Computer Science and Electronic Engineering at the University of Essex.

I am the principal investigator of this study. I would like to invite you to take part. Before you decide whether to participate, it is important for you to understand why the study is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish.

Please contact me if anything is unclear or if you would like more information before deciding whether to participate.

Contact Details

Principal Investigator
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Location
University of Essex
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What is the purpose of the study?

The purpose of this study is to investigate how accurately people classify ocean marker buoys from their visible physical features, with access to a buoy reference chart, and to compare human performance with that of a range of AI models.

This study is taking place as part of my PhD research.

Why have I been invited to participate?

You are being invited because you are over the age of 18, able to give informed consent, and can comfortably use a website.

Previous sailing or maritime experience is not required. A buoy reference chart will be available during the task.

Do I have to take part?

You do not have to take part if you do not wish to. Participation is entirely voluntary. You may stop participating at any time without giving a reason and without penalty.

Before beginning the experiment, you will be asked to confirm your consent by ticking four statements on the website. Giving consent does not remove your right to withdraw later.

If you stop participating, answers already submitted will remain saved and may be used in the research unless you request their deletion before the withdrawal deadline described below.

What will happen to me if I take part?

The study takes place online at a time of your choosing.

You will choose a memorable unique identifier, read this information sheet, confirm your consent, and enter the experiment access code provided with your invitation. Please do not use your real name, email address, or other personally identifying information as your identifier.

If you are joining from SurveyCircle please follow those instructions to join instead.

You will be shown **702 synthetic images**, one at a time:

- 630 images containing marker buoys; and
- 72 control images containing no buoy.

For each image, you will select the buoy category that you think is correct. An "Unsure" option is available if you cannot identify the category and a "No Buoy" option if you cannot see any buoy in the scene.

A buoy reference chart will be available throughout the experiment.

Please allow approximately 10–120 minutes, including reading the instructions and consulting the chart. This is a provisional estimate and individual completion times will vary. Breaks will increase the elapsed time. You do not have to answer all of the questions.

Each answer is saved as you proceed. You may take breaks or close the website and return later. To resume, return to the start page and enter the same identifier and access code.

What information will be collected?

The website will record:

- your consent confirmations, the wording and version of the consent form, the information-sheet version, and the time consent was recorded;
- a hashed representation of your chosen participant identifier;

- the images assigned to your experiment and their order;
- your selected category for each image, including any "Unsure" responses;
- the correct category and whether each response was correct;
- image identifiers, dataset labels, trial numbers, and answer timestamps; and
- experiment start and completion times, progress, and completion status.

The website also uses cookies and hashed browser visitor identifiers for session access and page-view analytics. Analytics include page-view counts and visit timestamps.

You will not be asked to provide your name or email address as part of the experiment.

What are the possible benefits of taking part?

There may be no direct personal benefit to taking part.

Your contribution will support research into human and AI recognition of marker buoys. This forms part of wider research into developing autonomous safety systems for unmanned surface vessels.

What are the possible disadvantages and risks of taking part?

You may experience fatigue or frustration while completing the task. You can take breaks or stop participating at any time without penalty.

How will my data be stored and who will have access to it?

Research records are stored electronically in Firebase Realtime Database.

Your chosen participant identifier is converted into a secret-key-based hash before it is stored in the experiment record. The original identifier is not stored in that record. This allows the website to match returning participants to their saved experiment and allows the researcher to locate records when a participant requests withdrawal.

Because records can be linked using your identifier, they are treated as pseudonymised rather than described as completely anonymous.

Access to research records is restricted to the principal investigator and PhD supervisor through controlled access to the research systems. Firebase and the website hosting provider process technical data as part of operating those systems.

Please keep your participant identifier private. If someone knows both your identifier and the experiment access code, they may be able to resume your experiment.

How long will my data be stored for?

Study data will be retained until 31 July 2027, unless you request deletion before the withdrawal deadline.

After this date, participant-level study records will be deleted from the active research systems. Backup copies will be managed under the applicable institutional and service-provider retention arrangements.

Anonymous aggregate results already included in research reports or publications may remain available.

Will my participation be kept confidential?

Your research records will be treated confidentially and handled by the principal investigator and supervisory team, unless disclosure is required by law.

Please do not include your name, email address, or other personally identifying information in your chosen identifier.

If you contact the researcher by email, that correspondence will contain your email address and will be handled confidentially.

How will my data be used and in what form will it be shared further?

Your responses will be used to analyse buoy classification performance, including differences between normal and Other Than Ideal images and between buoy categories. Human performance will also be compared with AI performance.

Findings may be reported in my PhD thesis, academic publications, and presentations. Published findings will use aggregate results or examples that do not identify individual participants. Your participant identifier and its stored hash will not be included in published findings.

Withdrawing my data

You can stop participating at any time by closing the website.

To request deletion of your previously submitted research data, email rlayfl@essex.ac.uk on or before **1 July 2027**, using the subject:

WITHDRAW MY DATA BUOY RECOGNITION STUDY

Please include the unique identifier you used for the experiment so that your records can be located. You do not need to give a reason.

Please retain your identifier: without it, it may not be possible to locate your records.

After 1 July 2027, removal of your contribution from the analysis may no longer be possible. Anonymous aggregate results already published cannot be traced back to, or removed for, an individual participant.

What is the legal basis for using personal data and who is the Data Controller?

The University processes personal data for the primary purpose of research under the lawful basis of processing set out in Article 6(1)(e) of the UK GDPR, "processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller".

The University's lawful basis for processing Special Category data is Article 9(2)(j), "processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1)".

Using this lawful basis requires the University to also meet a substantial public interest condition as set out in Schedule 1, Part 1 of the Data Protection Act 2018. The condition

that the University will use is 4. Research, etc.

Under UK data protection legislation, the University acts as the Data Controller for personal data collected as part of the University's research. For more information on data protection legislation and your rights, visit the University's Data Protection and Research Activity webpage. For any queries, email dpo@essex.ac.uk.

Who has reviewed the study?

University of Essex Ethics Committee.

ERAMS reference: ETH2526-1181.

Concerns and complaints

If you have any concerns about any aspect of the study or wish to make a complaint, please first contact the principal investigator, Richard Lay-Flurrie, using the contact details above.

If you remain concerned, your complaint has not been addressed to your satisfaction, or you feel unable to approach the principal investigator, please contact the departmental Director of Research, Prof. Nikolaos Thomos, at nthomos@essex.ac.uk.

If you are still not satisfied, please contact the University of Essex REO Research Integrity Manager at reo-integrity@essex.ac.uk.

Please include the ERAMS reference ETH2526-1181, the study title, the researcher involved, and details of your concern or complaint.

Will I be recorded and how will the recorded media be used?

No audio or video recordings will be made. The website records your experiment responses and the technical information described above.