

**Northeastern University Department of Electrical and Computer Engineering**  
**Protocol Title: Electromagnetic Scattering Analysis for Detection of Threats**  
**Principal Investigator: Carey Rappaport, Research Investigator: Alyssa White**

### **Informed consent to Participate in Research Study**

We are inviting you to take part in a research study. This form will tell you about the study, but the researcher will explain it to you first. You may ask this person any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. You do not have to participate if you do not want to. If you decide to participate, the researcher will ask you to sign this statement and will give you a copy to keep.

#### **Why am I being asked to take part in this research study?**

You have expressed an interest in participating in the testing of various imaging techniques in order to determine optimum detection of threats capabilities. These various types of technologies have all been proven safe for human exposure.

#### **Why is this research study being done?**

The goal of this research is to validate computer models and reconstruction algorithms for imaging concealed and non-concealed anomalies (irregularities) on humans.

#### **What will I be asked to do? Where will this take place, and how much of my time will it take?**

You will come to the lab in the Egan building where the equipment is kept. You will follow standard airport and medical screening procedure which includes removal of:

- Cell phone
- Belt
- Jacket
- Hat
- Wallet
- Keys
- Coins

Eyeglasses, piercings/earrings, smaller jewelry and rings may be left on.

Test objects and simulants, known as 'coupons', will be placed at predetermined positions on your body. Locations are chosen to cover a range of simulated threat situations. If you are uncomfortable with any of the requested coupon placement positions, they can be omitted or changed. You can place the coupons yourself, or get help from a researcher of the same gender upon request.

You will be asked to stand still in a certain position in front of the imaging machine. You will be exposed to X-ray backscatter and millimeter wave energy, both of which are currently being used

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every day in airports around the world. Along with this, you may also be imaged using other non-invasive modalities such as thermal imaging, passive nuclear quadrupole resonance, (a no-contact method to safely screen for chemical signals of explosives) and video, all at power levels less than sunlight.

The imaging session will not last more than 30 minutes. You may be asked to return for up to three more sessions, which you can choose to accept or decline.

**Will there be any risk or discomfort to me?**

The x-ray backscatter unit was monitored for background radiation for 7 months by the Northeastern Office of Environmental Health and Safety. Minimal doses of background radiation were reported.

Millimeter waves will produce an affect similar to that of a cell phone.

Coupons are not dangerous materials, they are only stimulants for such materials.

**Will I benefit by being in this research?**

Although there will not be any direct benefit to you, it is hoped that the research will contribute to improve overall detection of harmful substances and threats on humans.

**Who will see the information about me?**

Your identity in this study will be confidential. Subject-identifiable data (your name) will be kept in a password protected database accessible only to necessary research staff. No reports or publications will use information that can identify you in any way. The data from your images will be identified with a study number only. The researchers will have general access to the age, gender, ethnicity and BMI information associated with your images, and will see only a code associated with the image to identify the subject. The P.I. will hold the password protected key for the code and subject name association.

All data, images and information will be kept on encrypted hard drives and computers. Only researchers who know the decryption code will have access to the data. Data will be kept indefinitely for research purposes.

**What will happen if I suffer any harm from this research?**

In the unlikely event that you suffer harm from this research, please report immediately to the Principal Investigator, Professor Carey Rappaport.

**Can I stop my participation in this study?**

Your participation in this research is completely voluntary. You do not have to participate if you do not want to. Even if you begin the study, you may stop at any time. If you do not participate or if you decide to quit, you will not lose any rights, benefits, or services that you would otherwise have [as a student, employee, etc].

**Who can I contact if I have questions or problems?**

-Carey Rappaport

617-373-2043, rappapor@ece.neu.edu

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