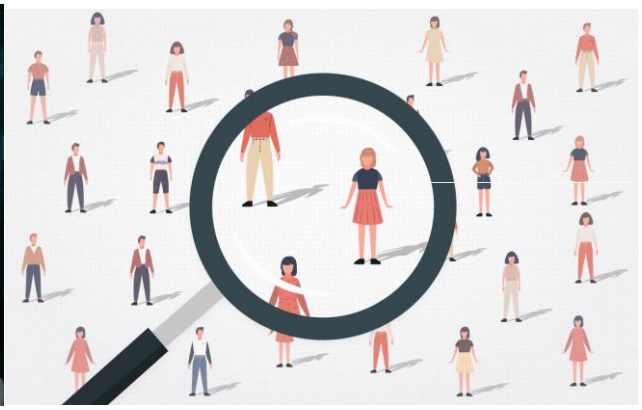
SILVER CREST AWARD

ARTIFICIAL INTELLIGENCE APPLICATIONS AND ETHICS

Recommended for 14 - 18 year olds

30 hour research project



Learning about AI applications and the importance of considering ethics and bias in these applications

#AI
#machinelearning
#bettersociety
#ethics

TEACHER GUIDE

How to run a Silver CREST Project

Main activities your students will need to complete to achieve a CREST Silver Award (approximately 30 hours of project work)

- **Learn about Artificial Intelligence (AI) including the ethics and potential bias**
- **Come up with a potential application of AI**
- **Research the ethics and bias that might be associated with this application**
- **Write a project report or portfolio of evidence**
- **Reflect on their work using the student profile form**

Sign Up with CREST

The first step is to sign up with CREST. Create a new Silver Award project with the name(s) of the student(s) and the title of the project.

CREST Criteria

Before starting the project, read through the Student Guide and Student Profile Form to help you understand what is required and what the assessor will be looking for.

Research

At the beginning research 'what is AI?' and its possible future applications. Then investigate the ethics of AI, especially in respect to bias from data used in training AI.

Running the Project

Encourage students to use the guides and to document all their work as they go along. A project diary will help with the final report. Help students to consider health and safety risks.

Support

Find a mentor for your students by contacting UKESF. Email: electronics.everywhere@ukesf.org

Reflection

The Student Profile form has a 'Personal Reflections' section which will need to be completed, reflecting on all the skills acquired during the project. For group projects students can all submit the same joint report but they will need to complete an individual Student Profile form.

Entering Project for CREST Silver Award

Upload the completed report and other evidence such as pictures and diagrams. Complete delivery and payment details.

REMEMBER:

Creating a project using this resource does not guarantee a CREST award. Projects must still meet the CREST criteria and will be assessed by CREST external assessors – their judgement is final.

CREST Sign in To register and set up the Silver Award Project.
Student Profile Form For students to download and fill in.
Student Guide To help the students follow the CREST criteria for their project.
Engineering Ethics in Practice A guide for Engineers about ethics. A good reference for teachers.

STUDENT PROJECT GUIDE

ARTIFICIAL INTELLIGENCE APPLICATIONS AND ETHICS

Project Brief

Artificial Intelligence (AI) has made a significant impact on our daily lives. It is used in many ways from medical diagnosis to self-driving cars. But what exactly is AI? The AI industry has expanded massively in the past few years. When creating AI applications, do the developers think about the impact on us?

In this project you will learn all about AI. You will research into the current applications. In addition, you will research ethics and data bias. These concepts are more important than ever to the designers creating these AI applications.

For example, AI is used extensively in search engines. Try two image searches: “school boy” and “school girl”. The results will reveal quite different images. The boys are mainly ordinary young school boys, but the girls are usually adults in sexualised costumes. AI systems deliver biased results. (UNESCO - Biased AI)

You will need to research what AI is already being used form then come up with your own application and consider the ethics and potential data bias for your application.

Research

Start by finding out more about AI. What is it? What is it currently used for?

You will also see the term “Machine Learning”. AI is the umbrella term for allowing a machine to simulate human intelligence to solve problems.

Machine learning is allowing a machine to learn autonomously from past data. There are some links in the resources below. But also do your own searching. There are new articles about machine learning all the time.

Your Project idea

At this point in your project, you should know a lot more about AI and now it’s time to think of your concept for a possible application of AI. First consider what are the benefits of AI. Which part of society could benefit from this. Here are just a few you could consider:

- healthcare and life sciences (e.g. augmented diagnostics)
- manufacturing (e.g. predictive maintenance)
- e-commerce and retail (e.g. recommendation engines)
- financial services (e.g. automated trading)
- telecommunications (e.g. intelligent networks)

Alternatively, you might want to write about the issues in current AI. You could consider looking into whether machine learning is biased, racist and sexist? Or the impact of ChatGPT in school assessments. Or how AI will change the gaming industry.

IBM – What is machine Learning
Royal Society – Machine Learning Interactive Infographic
Real World examples of Machine Learning
Shocking AI Bias
Extract from Invisible Women: Exposing Data Bias in a World Designed for Men by Caroline Criado Perez
Ethics and safety of autonomous vehicles
Ethics of AI - UNESCO
Alan Turing Institute – Understanding AI and ethics
Women’s Safety and Security in the AI World (BCS)

STUDENT PROJECT GUIDE

ARTIFICIAL INTELLIGENCE APPLICATIONS AND ETHICS

Top Tips

Student Guide

Make sure you read the Student Guide, particularly the assessment criteria, so you know what the assessors will be looking for in your project. You will also need to fill in a Student Profile Form.

Research

Do your research!
You can use the internet, magazines, libraries, news articles, blogs and people as part of your research. Ask your teacher to help find a professional mentor if you feel that would help.

But research is not just at the beginning. As you start writing your report carry on researching ideas you have.

Primary data sources could be good for your project. This means you could either interview people about your topic or send out a survey to see what people think about AI.

Plan

Write and/or draw a plan showing how you will approach your project. List tasks to be completes, resources you will need and estimate how long tasks will take. Ask your teacher for feedback on your plan.

Part of your plan should include how you are going to achieve the Silver CREST Award criteria.

Concluding your project

What have you found out from your project?
What could your findings lead onto?
What problems have you overcome?
What is the impact of your project on other people?

Choose the best way to communicate your project

Producing a written technical report is a popular choice when presenting a project. But you can use a digital presentation or a blog or a poster display.

Whichever method you choose make sure to include all the stages of your project from initially learning about AI, to planning through to the conclusion.

Student Profile Form

Remember to fill in the Student Profile form.

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Full list of resources - web links

CREST
https://www.crestawards.org/sign-in

Student Profile Form
https://secondarylibrary.crestawards.org/crest-student-profile-form/62632654

Student Guide
https://secondarylibrary.crestawards.org/student-guide-silver/62444085

IBM – What is machine Learning
https://www.ibm.com/topics/machine-learning

Royal Society – Machine Learning Interactive Infographic
https://royalsociety.org/topics-policy/projects/machine-learning/what-is-machine-learning-infographic/

Real World examples of Machine Learning
https://www.salesforce.com/eu/blog/2020/06/real-world-examples-of-machine-learning.html

Shocking AI Bias
https://www.prolific.com/blog/shocking-ai-bias

Extract from Invisible Women: Exposing Data Bias in a World Designed for Men by Caroline Criado Perez
https://www.theguardian.com/lifeandstyle/2019/feb/23/truth-world-built-for-men-car-crashes

Ethics and safety of autonomous vehicles:
https://raeng.org.uk/media/nqnhktgq/nepc-safety-and-ethics-of-autonomous-systems.pdf

Ethics of Artificial Intelligence | UNESCO
https://www.unesco.org/en/artificial-intelligence/recommendation-ethics

Alan Turing Institute – Understanding AI and ethics
https://www.turing.ac.uk/sites/default/files/2019-06/understanding_artificial_intelligence_ethics_and_safety.pdf

Women's Safety and Security in the AI World (BCS)
https://www.bcs.org/articles-opinion-and-research/women-s-safety-and-security-in-the-ai-world/

Email for support from a STEM mentor:
electronics.everywhere@ukesf.org