

ALGORITHMIC CODING THEORY

WHAT IS IT? HOW DOES IT WORK?

The study of the properties of codes and their use in different applications [1]



3 main subcategories:

1. Error Correcting Codes

WORD → WORD
WORD

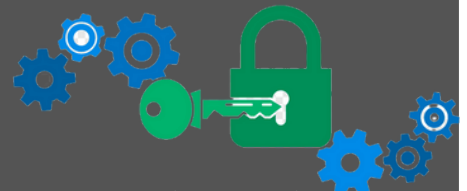
Add as little redundancy as possible. Correct as many errors as possible.
(In this example we store data multiple times to ensure it is correct) [2]

2. Data Compression



Reduce bits so that transferring files can be faster [9]

3. Cryptography:



Prevent third-parties from accessing private data by encrypting and decrypting messages [9]

ETHICAL ISSUES THAT MAY ARISE



FISCAL CONCERNS

- Stolen data can potentially be converted into currency (e.g. Bitcoin, Blockchain, Private Bank Info)



LOSS OF PRIVACY

- Network attacks or poorly encrypted files can result in leak of data
- Companies can lose their reputations



POOR USAGE

- Untraceable or difficult to trace crimes can be committed with highly secure encryption

HOW DO WE REDUCE ETHICAL ISSUES?

Identify the issue

Modify the Algorithm

Thorough Testing

Educate the future



COLLABORATIVE FIELD & CAREERS

How does algorithmic coding theory impact Engineering?

- Allows engineers to use efficient codes to complete tasks
- Allows engineers to design proper hardware to reduce errors
- Supports engineers by ensuring their data is not lost



Communication Electrical Engineer:

- Design and constructs electrical systems
- Allows for communication between electronics
- Transfer data between 2 points



Network Engineer:

- Design, organize, implement computer network's
- Provide secure connections
- Provide fast connections



POST-SECONDARY EDUCATION (Electrical Engineering)

Stanford [5]

- 3.96 GPA, 1450 SAT
- Large Campus
- Income Based Tuition



Waterloo [4]

- Low 90s
- Co-op program
- Good reputation



All of these universities offer deep courses on electrical engineering with amazing facilities.



M.I.T [6]

- 4.17 GPA, 1535 SAT
- Low student to faculty ration (3:1)
- STEM focused school

Sources (Link to document):

<https://docs.google.com/document/d/1cfSCBb2e8eJIYrAOYmKA5Qtly4bTuavsgdoHE50hGms/edit?usp=sharing>