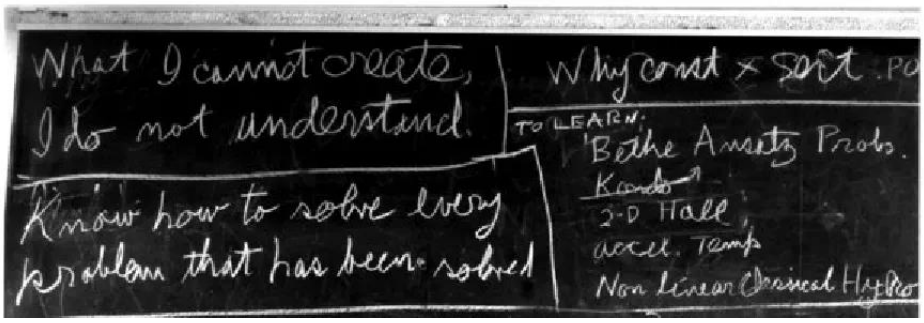
COMP 6001 Neuromorphic Algorithms and Computation

Assignment 1 – Video to Event Stream (35%) Due 22/09/2022 12:00pm Noon

Frame to event conversion is a technique commonly used to understand the principles of neuromorphic imaging. **The aim of this task is to produce an event stream (x, y, p, t) from a frame-based recording.**



"What I cannot create, I do not understand." Richard Feynman

Q1. (75%) Build an algorithm to convert a video sequence to an event stream with a reasonable SNR and high temporal resolution.

a. The video sequence is of your choosing from https://www.pexels.com/search/videos/slow%20motion/

b. The selected sequence must be 10 seconds long and have been captured with a frame-based sensor. I.e not completely computer (or similar) generated video sequences. If you are uncertain, ask your tutor/lecturer.

Q2. (15%) Evaluate and briefly justify your algorithms

a. Justification of algorithm choice (7.5/15)
b. Complexity (2.5/15)
c. Scalability (2.5/15)
d. Similarity to solutions within literature (2.5/15)
e. Profiling to identify bottlenecks (2.5/15)

Submission requirements:

1. Code must be presented using Jupyter Notebooks, or Matlab Live Script
    a. Functions and ‘under the hood’ components can be written as regular scripts, this is for communication purposes
2. Written components will need be written in a markup or similar format within the Notebook/Live Script
3. Submission is via GIT Classroom, and Turnitin (as plain text document of all code)