**Experiment Ideas**

* Investigate how a facial recognition model from hugging face performs on different quality of video. I.e. can facial recognition work reliably on security camera and other constantly recorded activities?
  + How well can businesses currently personally track customers using existing infrastructure?
* Maybe try to tune a model to predict a customer’s preferences based on their face.
  + Certain companies are trying to develop targeted ads using video cameras that monitor
  + Perhaps an ensemble model feeding facial recognition model into some other consumer preference model

**Tech Research**

* Main focus: how has the rise of deep learning and artificial intelligence changed Facial Recognition software?
  + High level overview:
    - <https://www.technologyreview.com/2021/02/05/1017388/ai-deep-learning-facial-recognition-data-history/>
    - Larger datasets and AI advances has greatly improved accuracy of facial recognition
      * AI requires even larger datasets which may incentivize infringement on privacy
    - The TrueDepth camera captures accurate face data by projecting and analyzing thousands of invisible dots to create a depth map of your face and also captures an infrared image of your face. A portion of your device's neural engine — protected within the Secure Enclave — transforms the depth map and infrared image into a mathematical representation and compares that representation to the enrolled facial data.
    - https://www.linkedin.com/pulse/science-behind-facial-recognition-how-your-devices-identify-ahammed-ewvoc
  + In depth Data Science articles
    - <https://news.mit.edu/2022/optimized-solution-face-recognition-0406>
      * Little bit about how facial recognition works; similar to brain
    - <https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210610_Crumpler_Lewis_FacialRecognition.pdf?VersionId=xdae_qQa80_Fimc1mzF3wxN6KIp.01Xg>
      * Good read for more in depth background
  + Legal Angle
    - <https://www.nationalacademies.org/news/2024/01/advances-in-facial-recognition-technology-have-outpaced-laws-regulations-new-report-recommends-federal-government-take-action-on-privacy-equity-and-civil-liberties-concerns>
      * Development has been rapid and outpaced legal regulation
      * [Full report](https://nap.nationalacademies.org/read/27397/chapter/1)
    - <https://www.securityindustry.org/2022/07/23/what-science-really-says-about-facial-recognition-accuracy-and-bias-concerns/>
      * Counter to popular science opinion, dissects the true, scary accuracy of facial recognition software.
        + Challenges traditional studies that show bias in facial recognition softwares
        + According to evaluation data from January 22, 2024, each of the top 100 algorithms are over 99.5% accurate across Black male, white male, Black female and white female demographics
* Do a survey of how effective different facial recognition softwares are
  + Huggingface
  + Get models with different
  + Compare different quality of videos efficacy