Feeding & Eating Evaluation viDeo analysiS (FEEDS)

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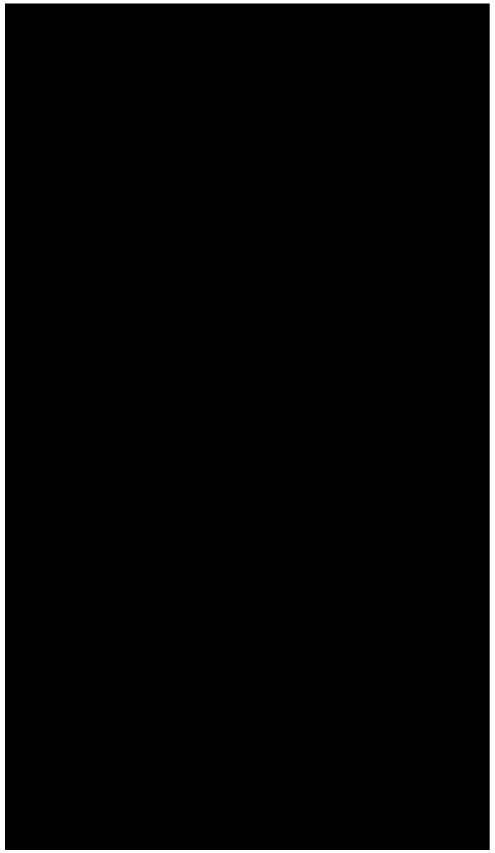
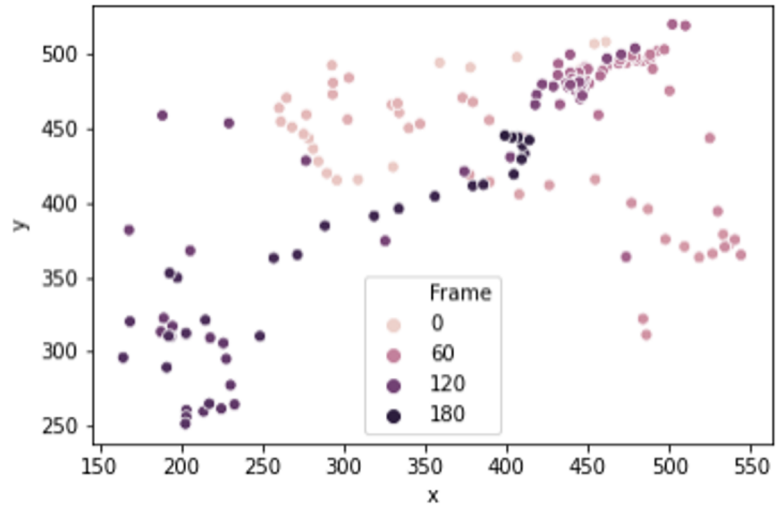
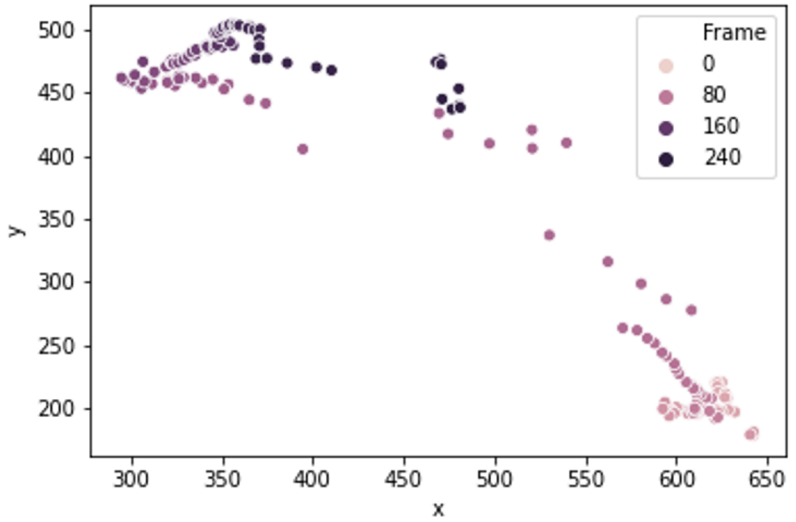
- Software identifies specific points on the face and hands.
- Applying machine learning techniques to characterise age-dependent eating skill and technique e.g.:
  - eating with hands or utensil
  - speed / smoothness of hand-to-mouth movement
  - accuracy of getting food in mouth
- Plan for future work - analyse chewing and swallowing coordination

Trajectory

Tracking the location of the hand through the video illustrates erratic vs smooth movement.







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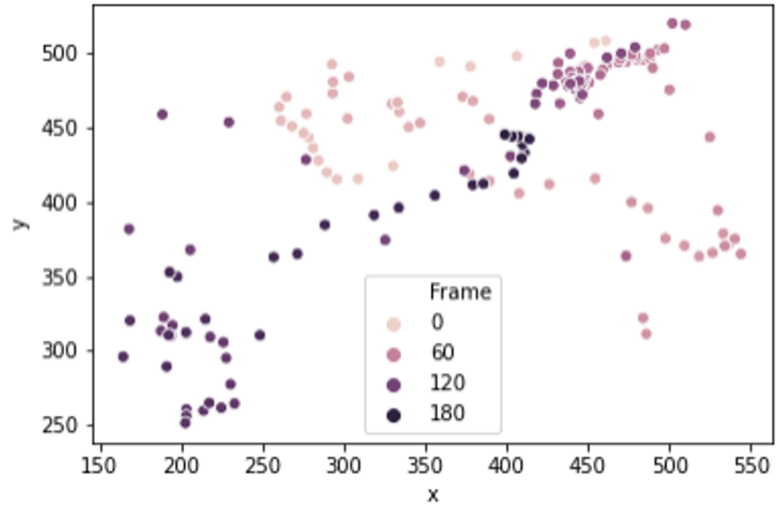
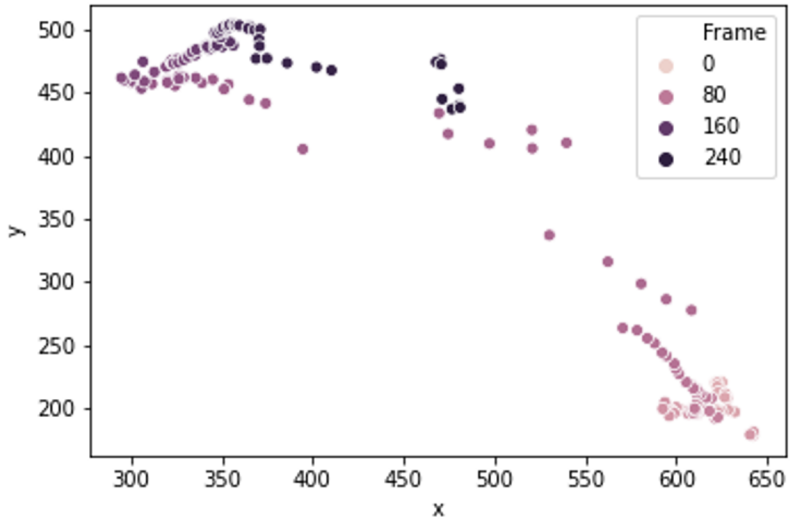
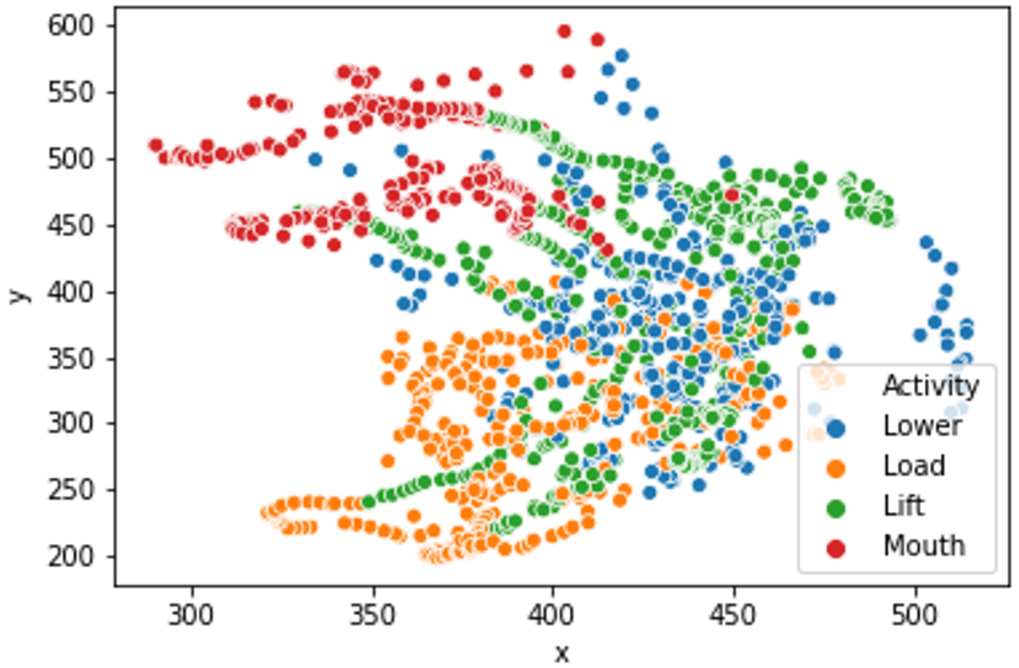




Trajectory

Plotting the trajectory over multiple plate-to-mouth actions shows the uniformity of the movements.



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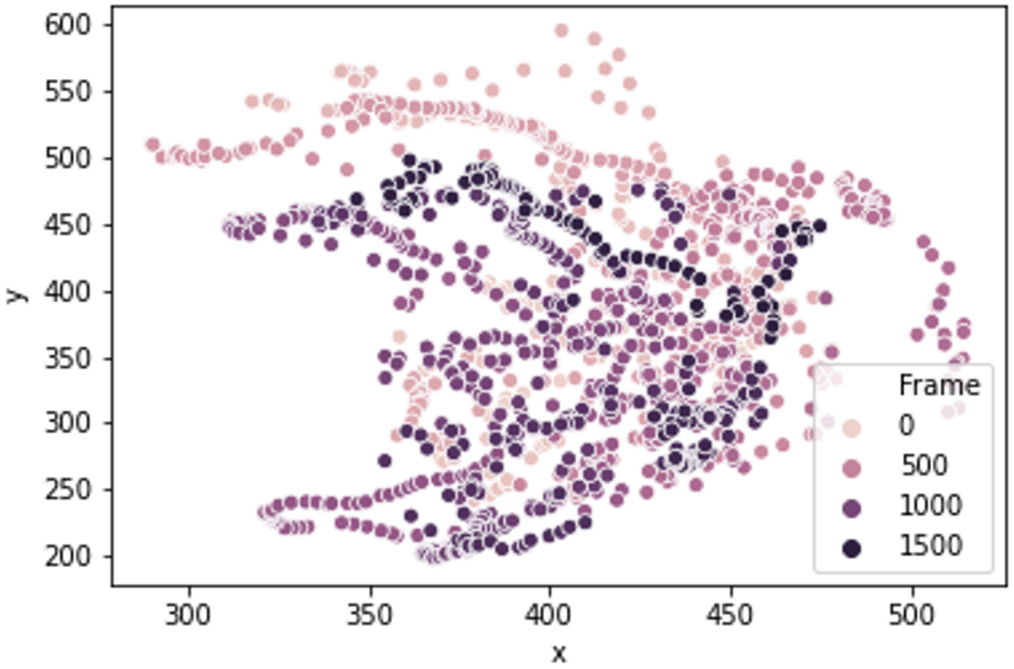
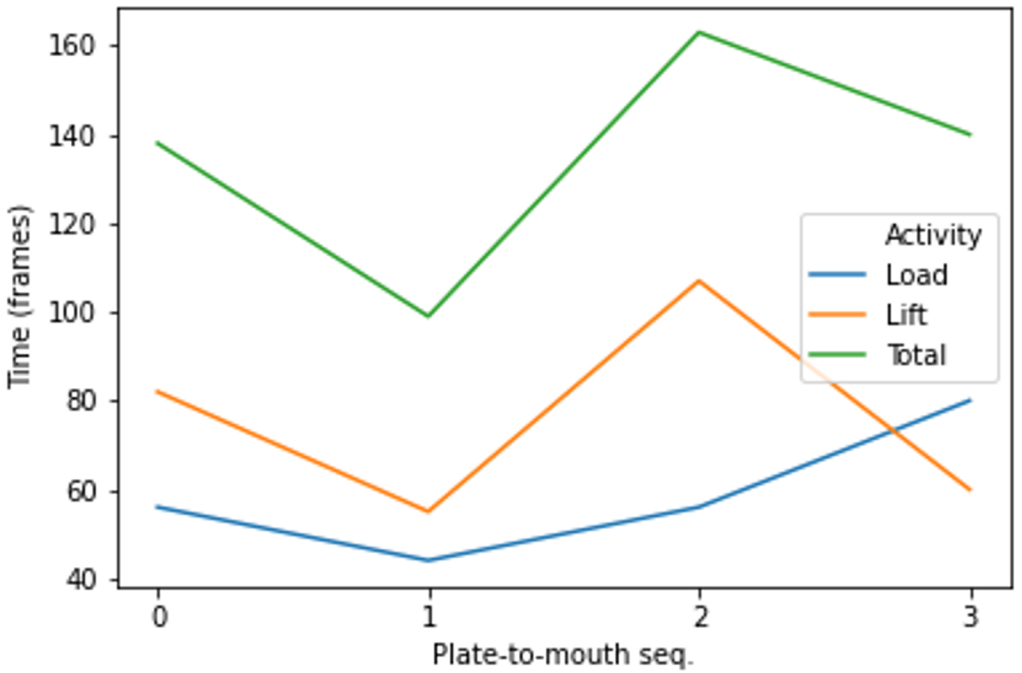


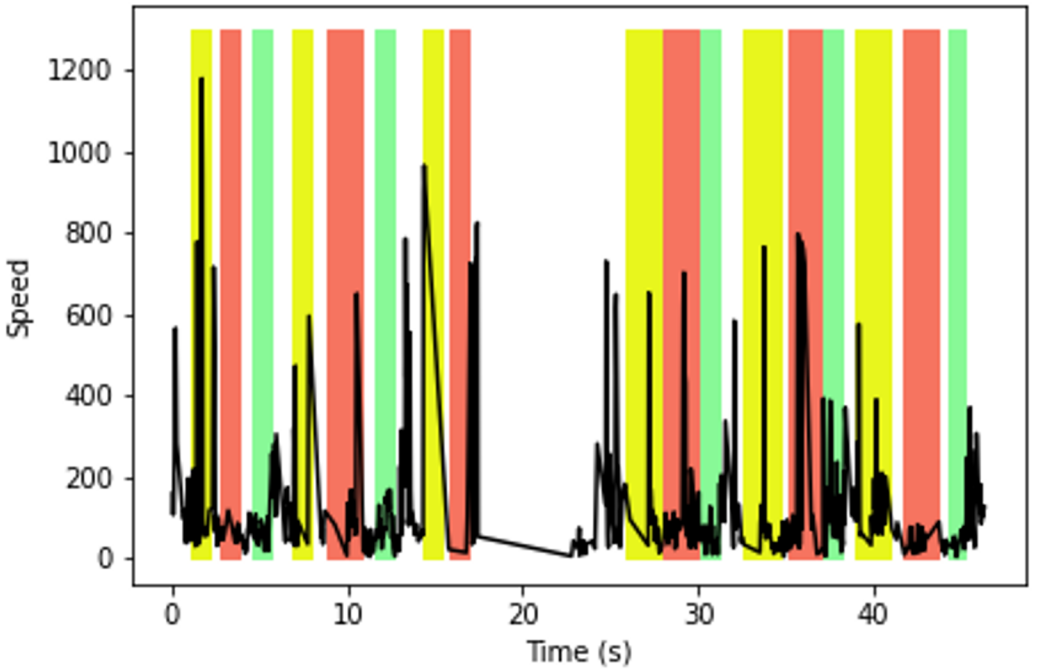
Time

Once the distinct actions of eating have been identified, they can be timed separately, highlighting any particularly difficult actions



Speed

Distance moved by the hand is scaled to generate a speed (pix / frame). The speed of each action can be analysed..



Future Work

Short-term (manual calculation)

Time taken for plate - to - mouth action (or alternative gestures)

Number of mouthfuls per minute etc.

Range of movement of arm (for anything involving distances we require something to use as a scale in the video i.e. an item of known size and location)

Example with shoulder, elbow and wrist added to the current technology