

# Steps to Analyze Micro- motion Trajectories

# Obtain the Individual's Reference Emotions

## 7FUME Signatures



ANGER



CONTEMPT



DISGUST



FEAR



HAPPINESS



SADNESS



SURPRISE

# Obtain the Face Kinematic-trajectories from the Narrative

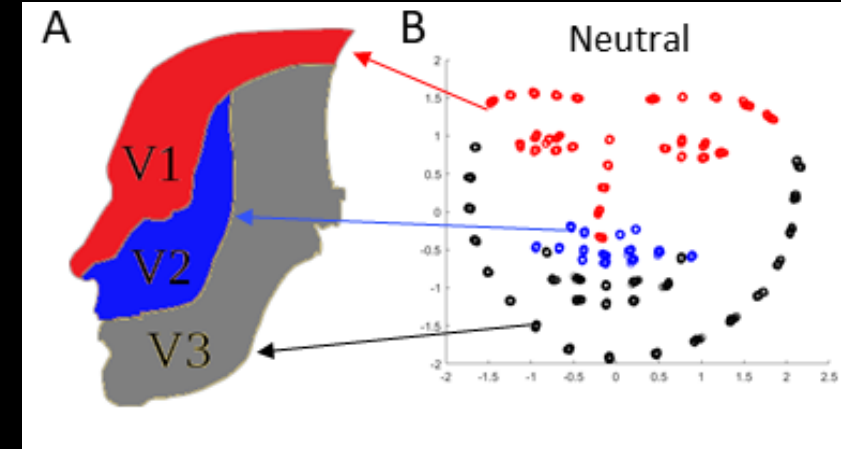
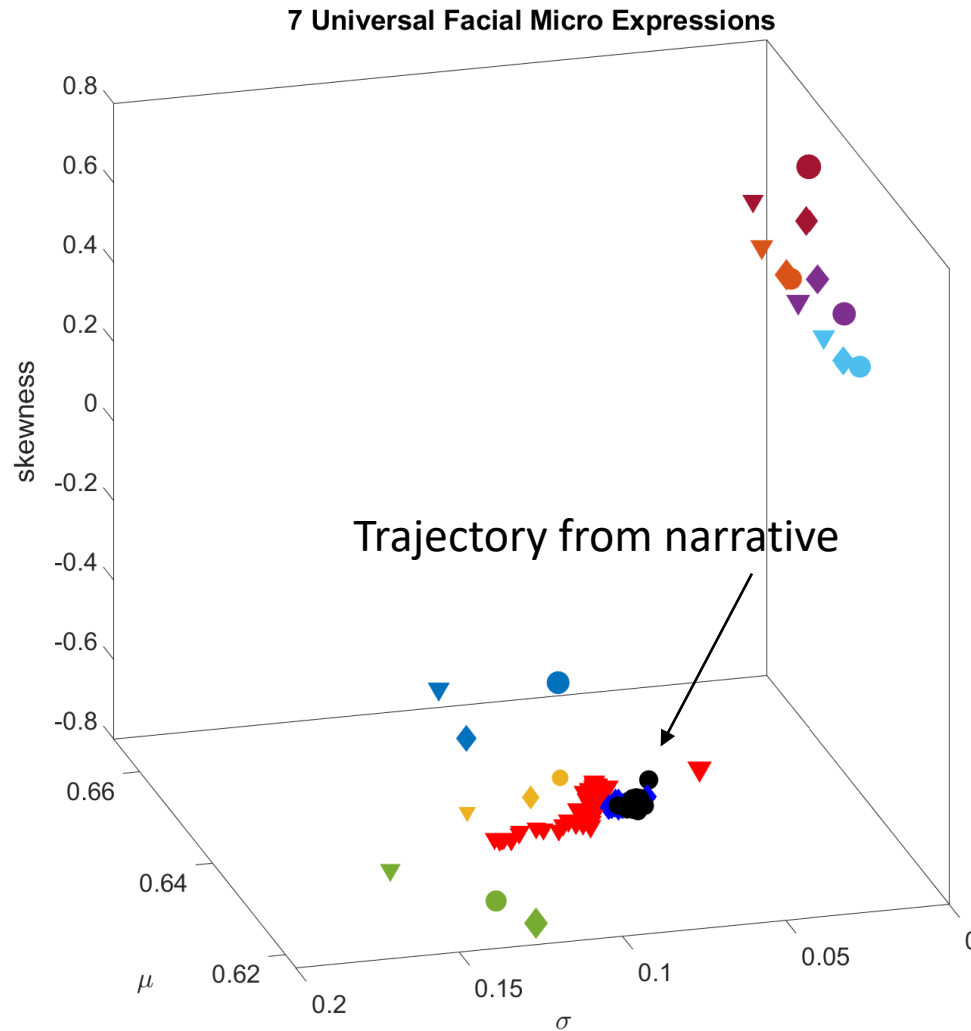


~18.25 MIN LONG @ 30fps  
5s windows with 10% overlap

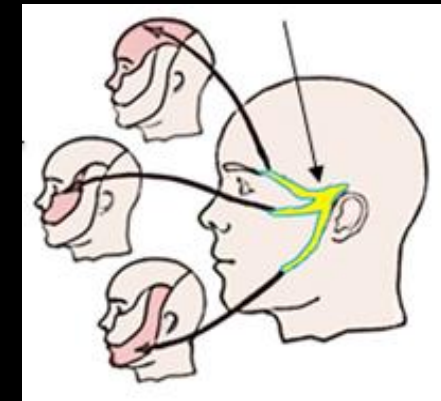
- Get the raw speed data
- Standardize it to account for allometric effects and create the MMS
- Run the Gamma parameter estimation to build the reference set of the 7 FUME, one for each micro-emotion
- Run a window of 1sec and 10% overlap to get empirically estimate, frame by frame, the Gamma trajectory
- Quantify the distance from each frame to the reference Gamma moments
- Localize the sentiment of the narrative on the Gamma moments space

# Parsing out stochastic signatures of emotions

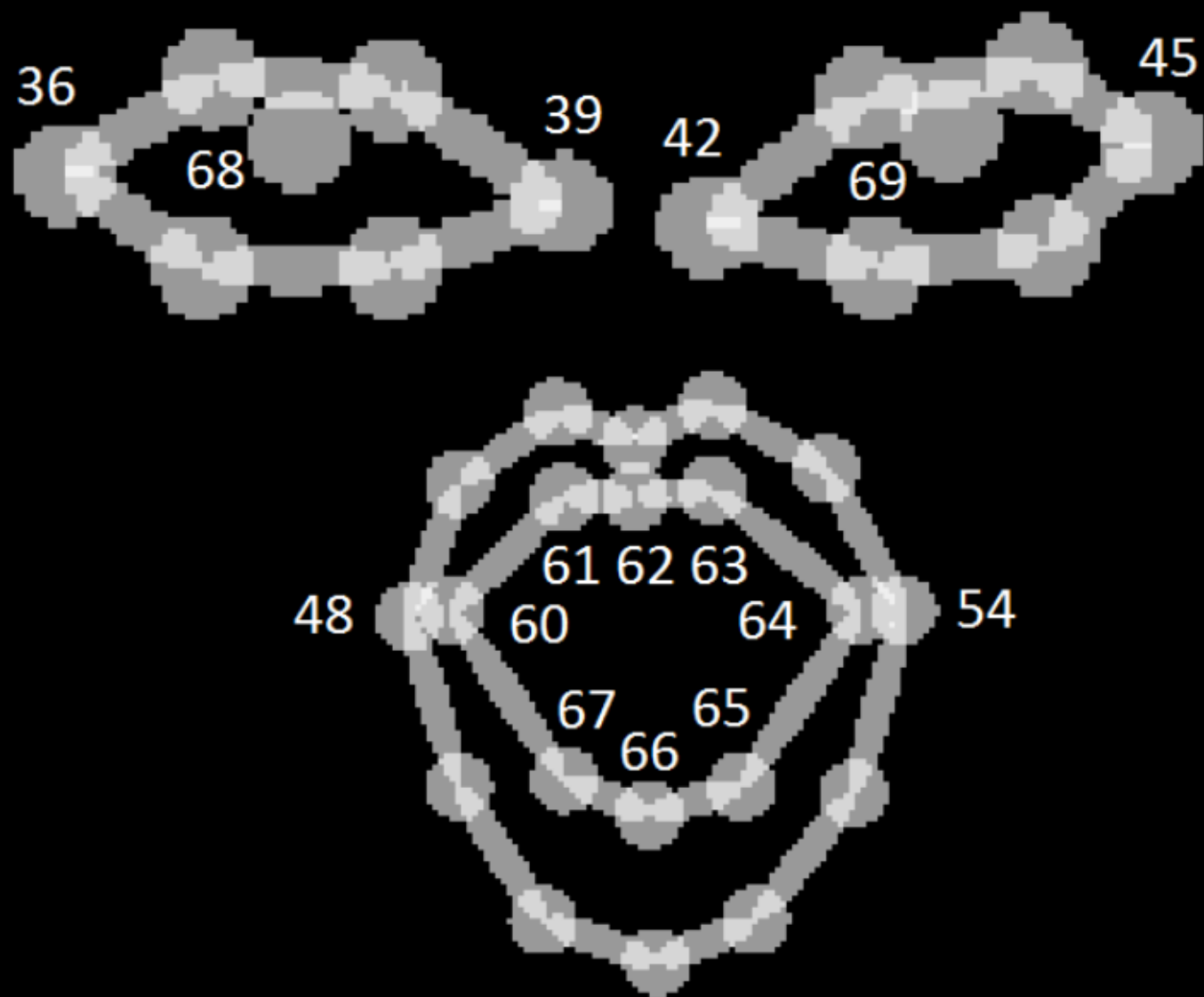
## Reference Signatures



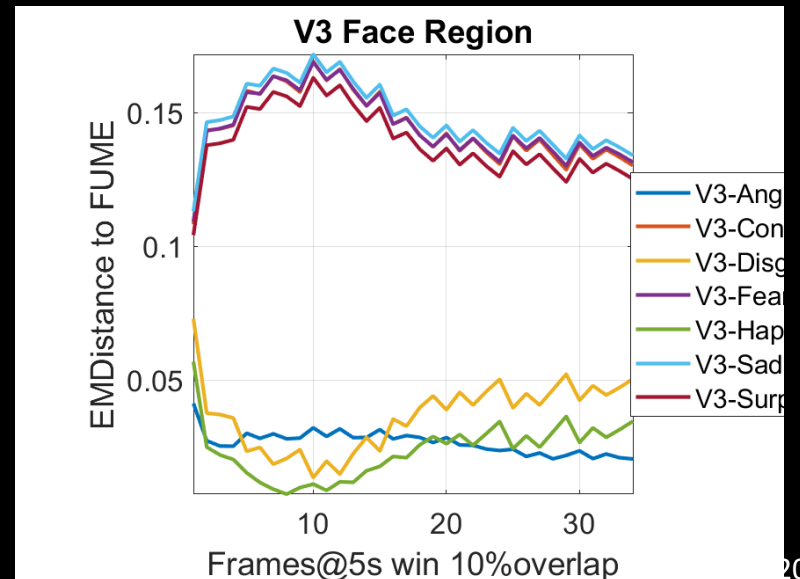
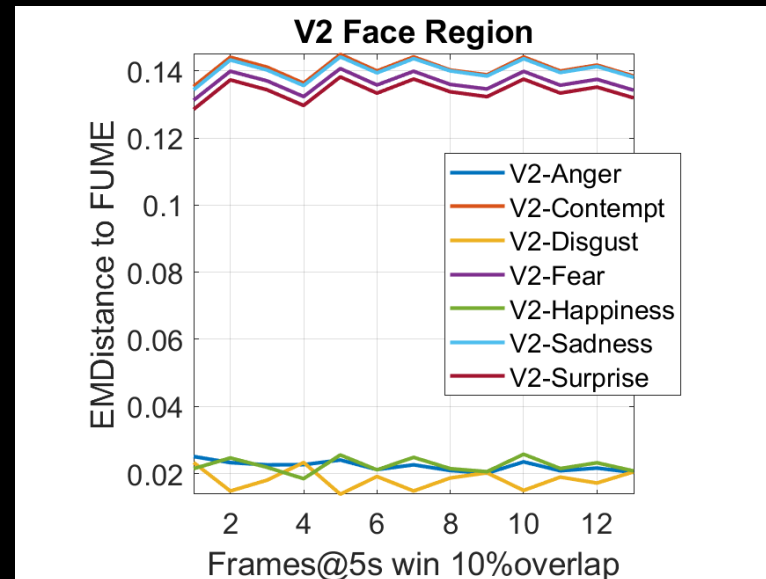
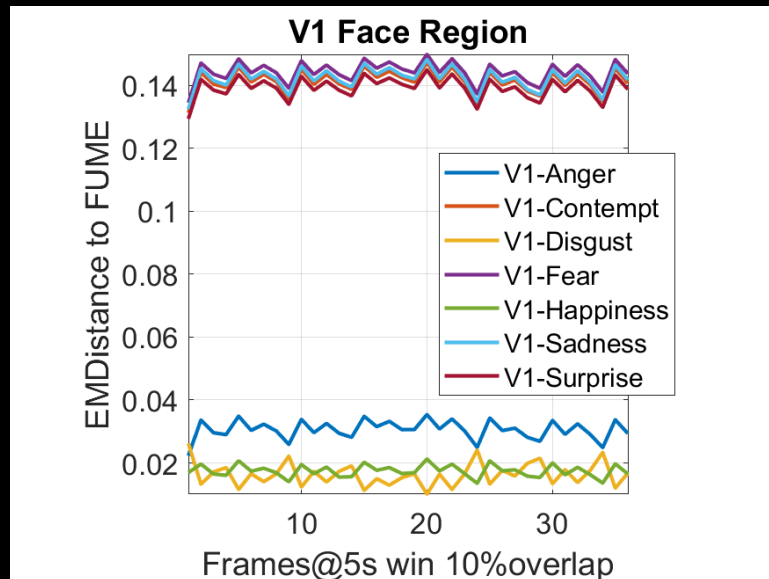
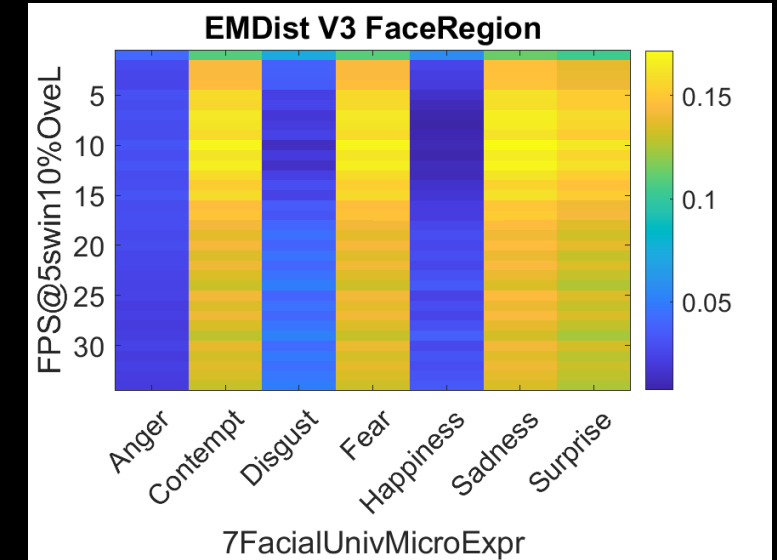
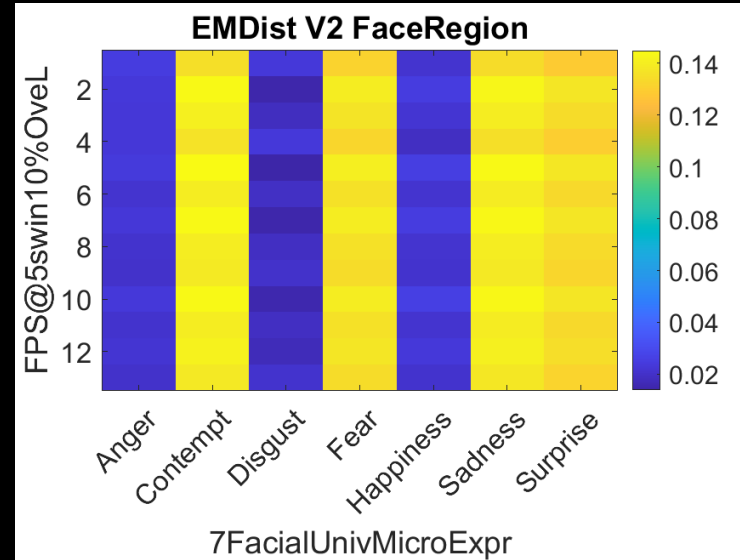
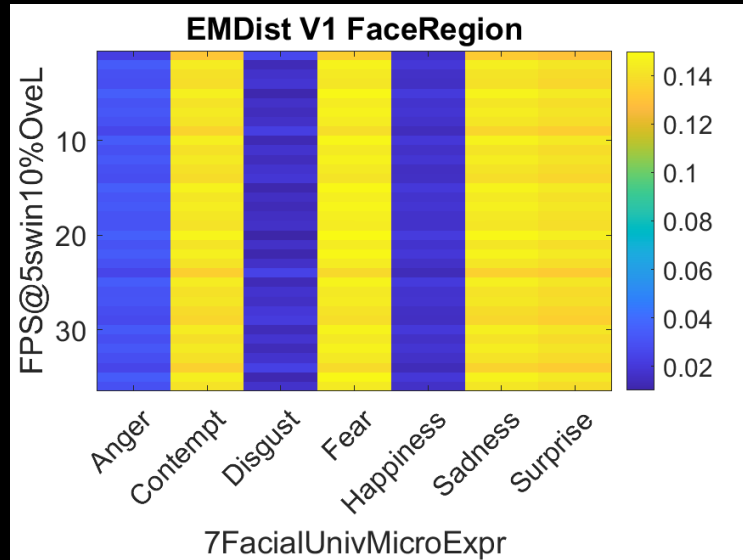
## Trigeminal Nerve



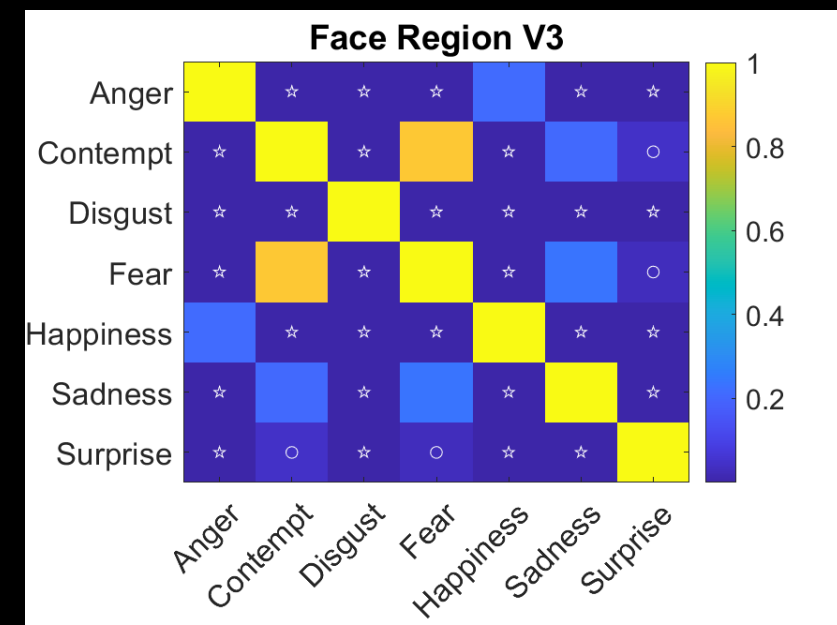
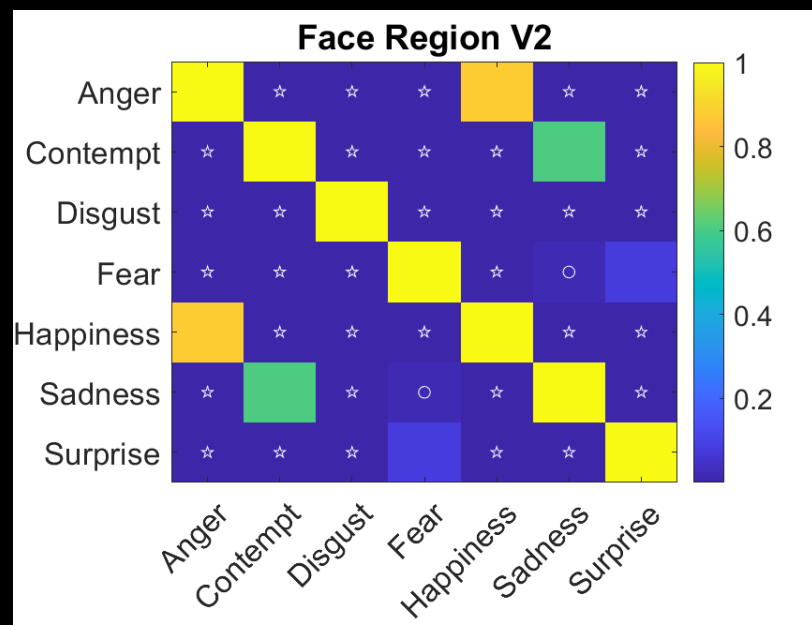
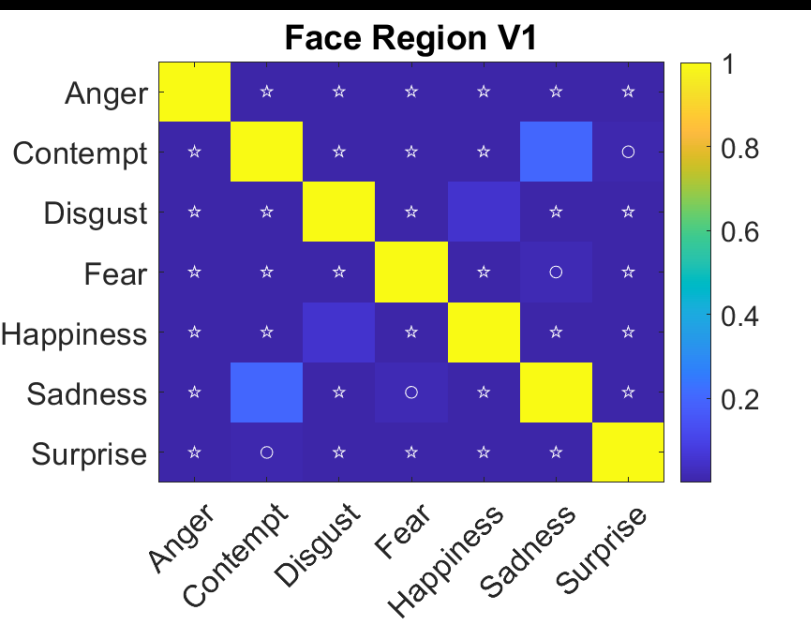
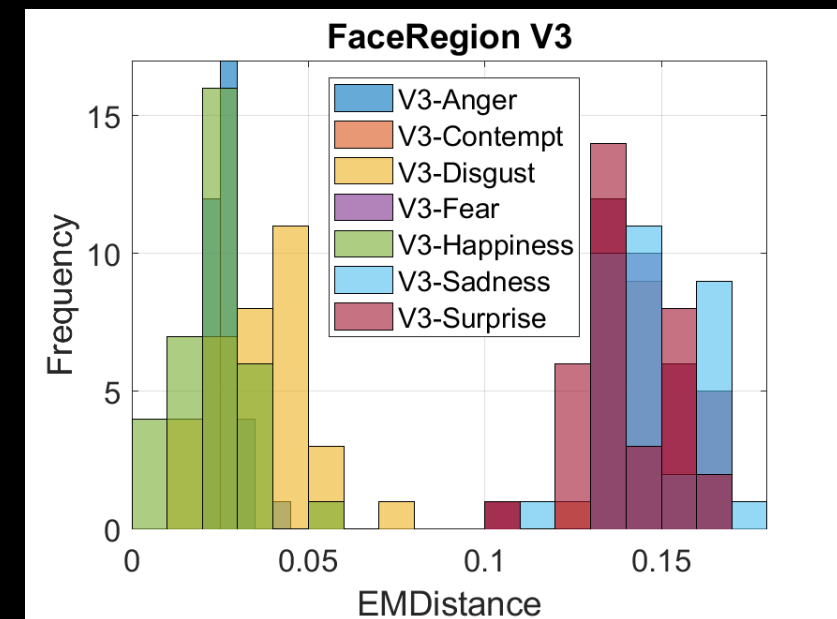
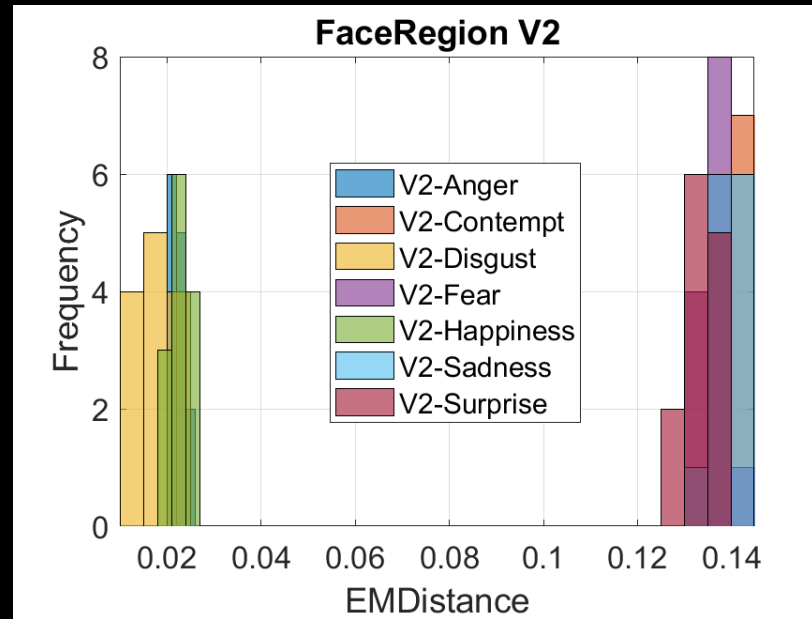
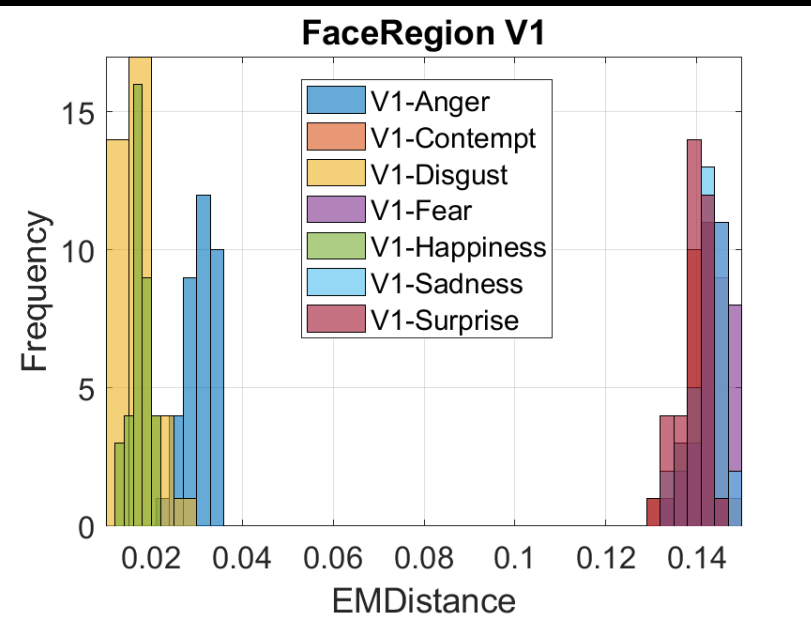
Tracking Face Regions V1, V2, V3 fall between Happiness and Disgust (Average Sentiment of this Narrative)



# Other Visualizations and Stat Analyses (Distance to Reference)

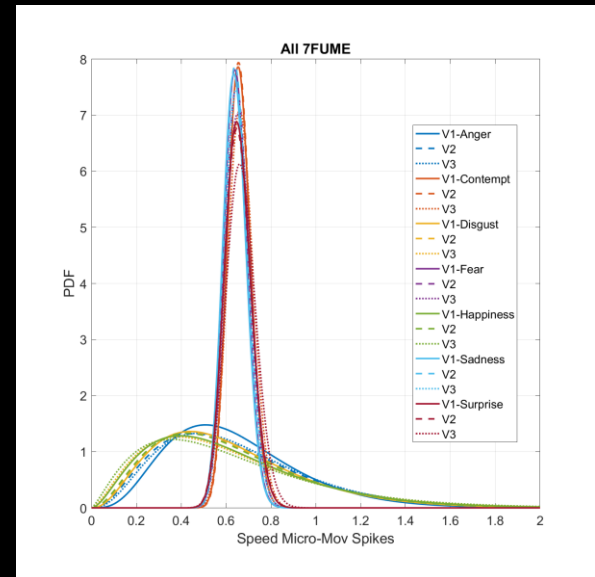
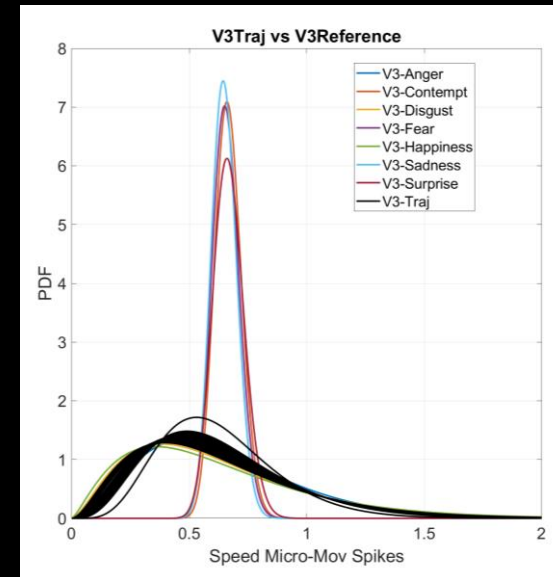
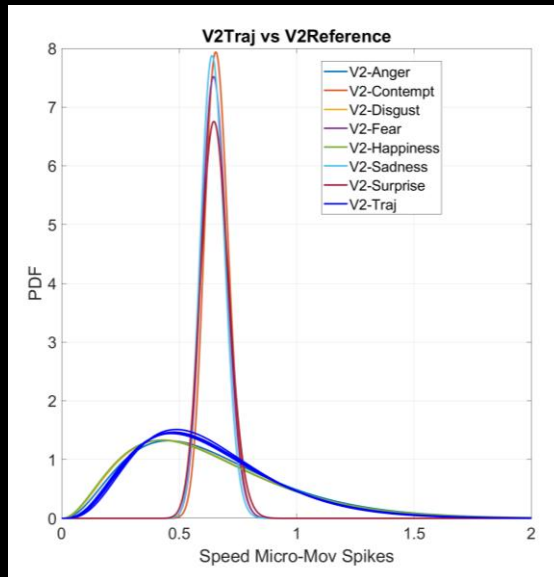
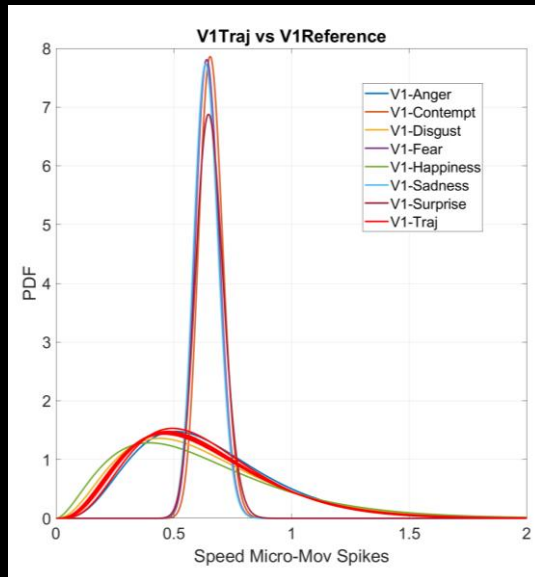
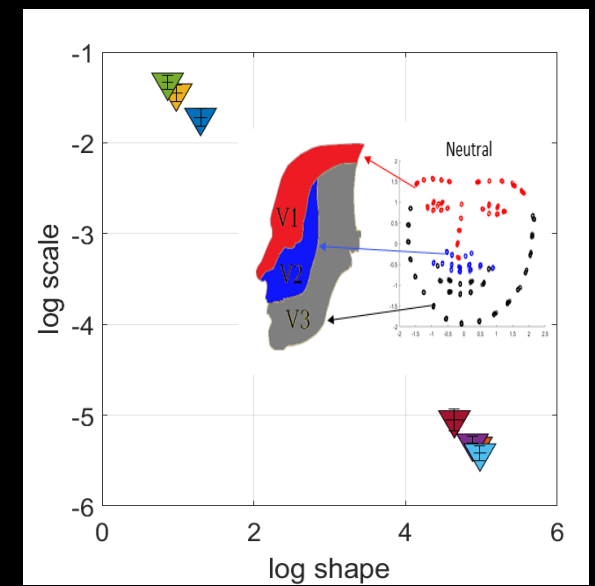
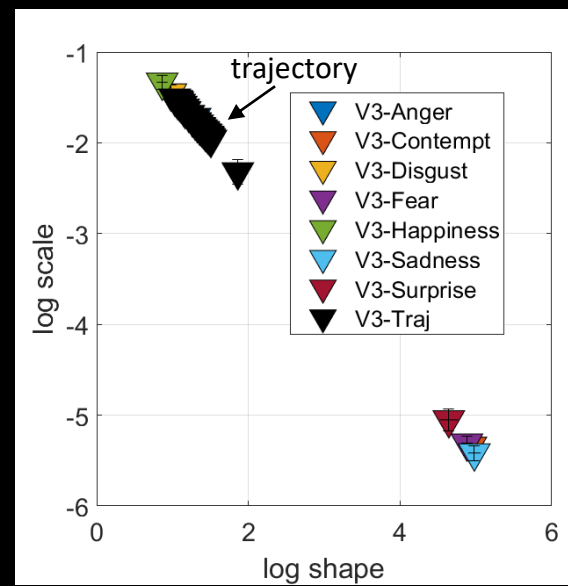
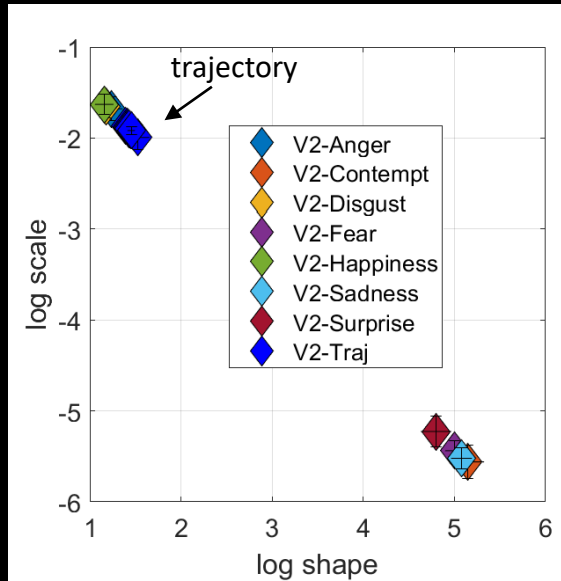
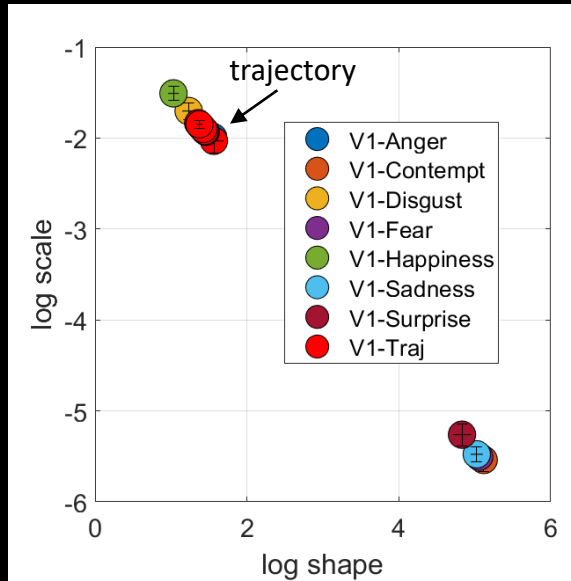


# Some Non-Parametric Stats





# Empirically Estimated PDFs 5sec window 10% overlap





# Motivation for the paper

- Characterize staged vs. spontaneous 7FUMES to quantify individual differences and build individualized reference set
- Compare these signatures in isolation vs social context
- Explore ways to automatically stratify a group
- Automatically track these 7FUMES in a Narrative
- Whose narrative is close to which 7FUMES (and from whom)
- Others?

# Trio – Ji – Mona – Liz (Neutral, Staged, Spontaneous Laughter)



NEUTRAL



STAGE TO SPONTANEOUS

# Build Reference for each stage

Neutral



Staged



Spontaneous



# Full Movie to Track Change

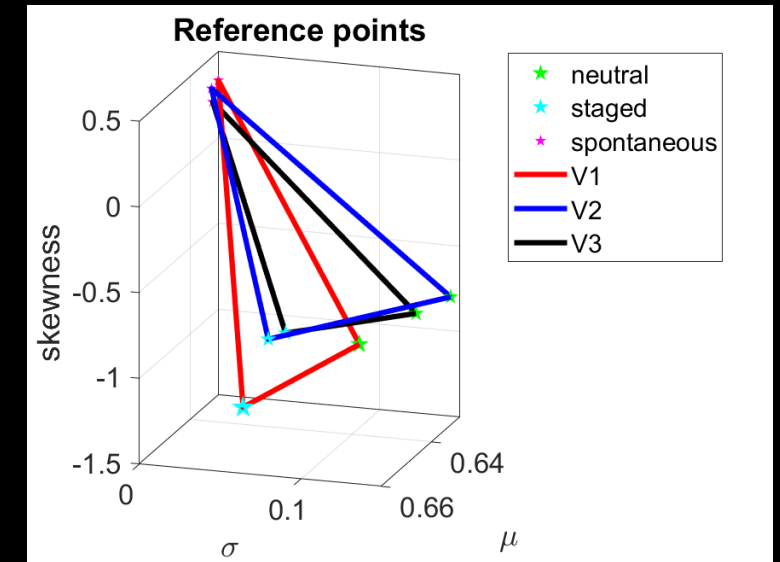
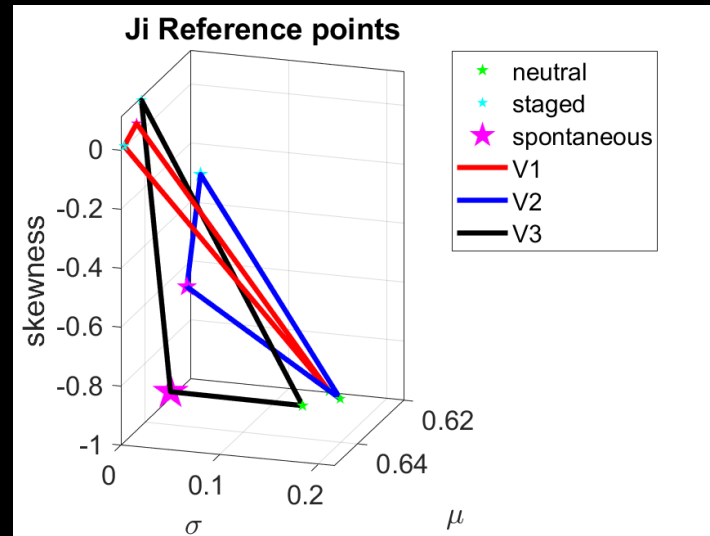
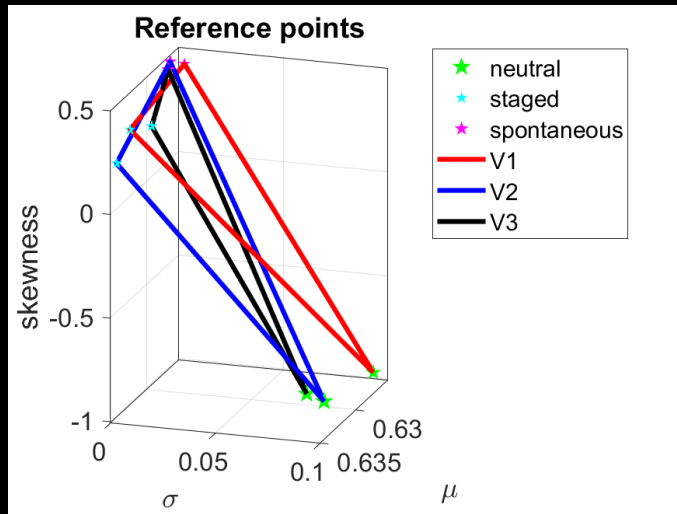
Mona



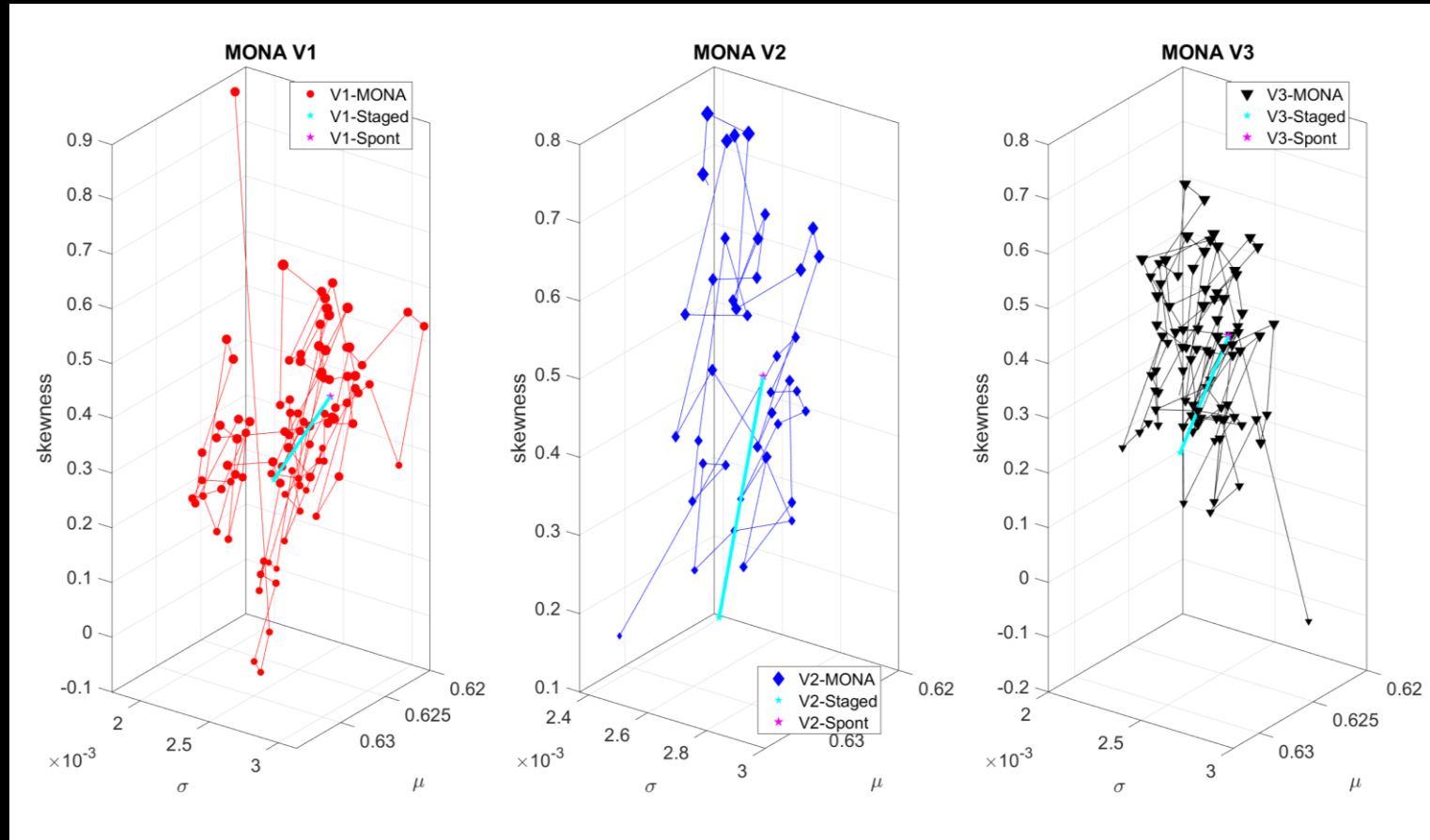
Ji



Liz

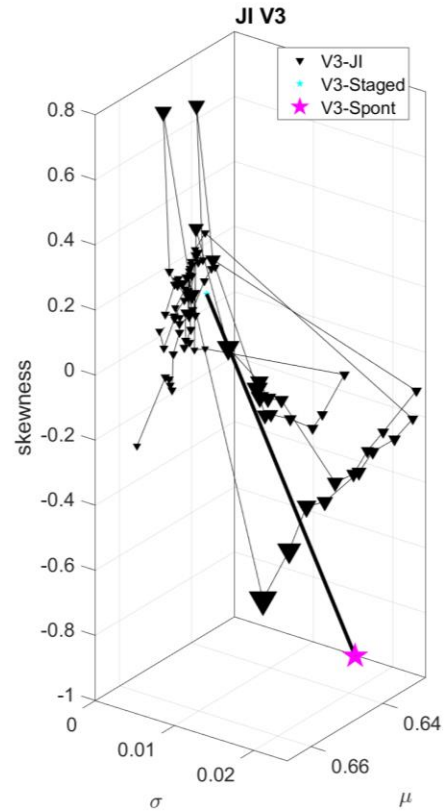
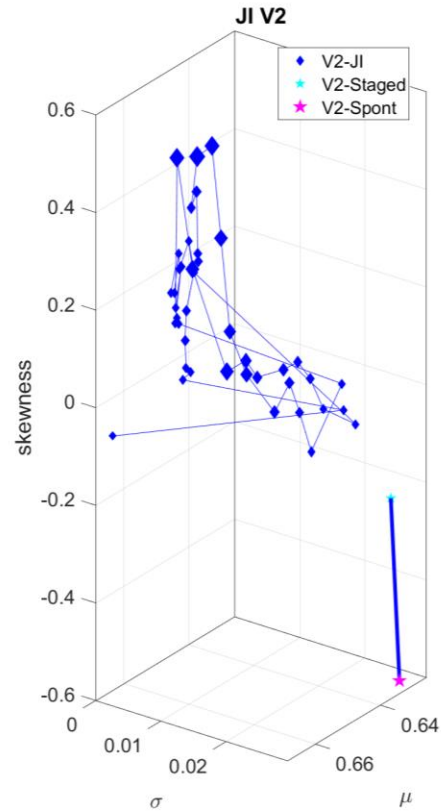
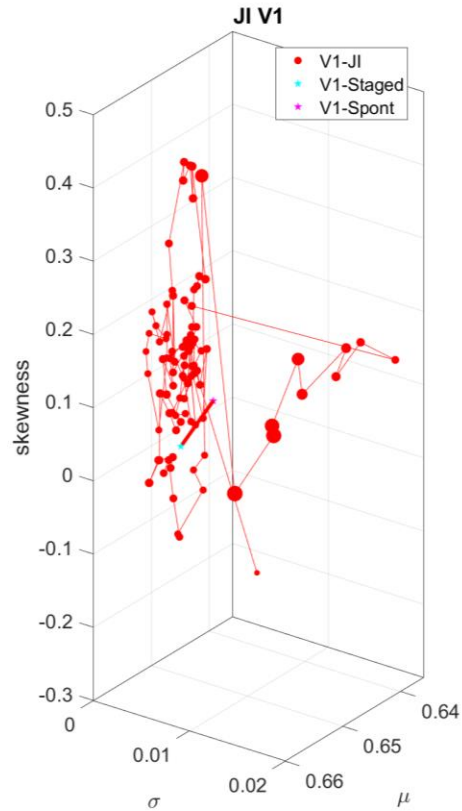


# Trajectories of V1-V2-V3 Mona



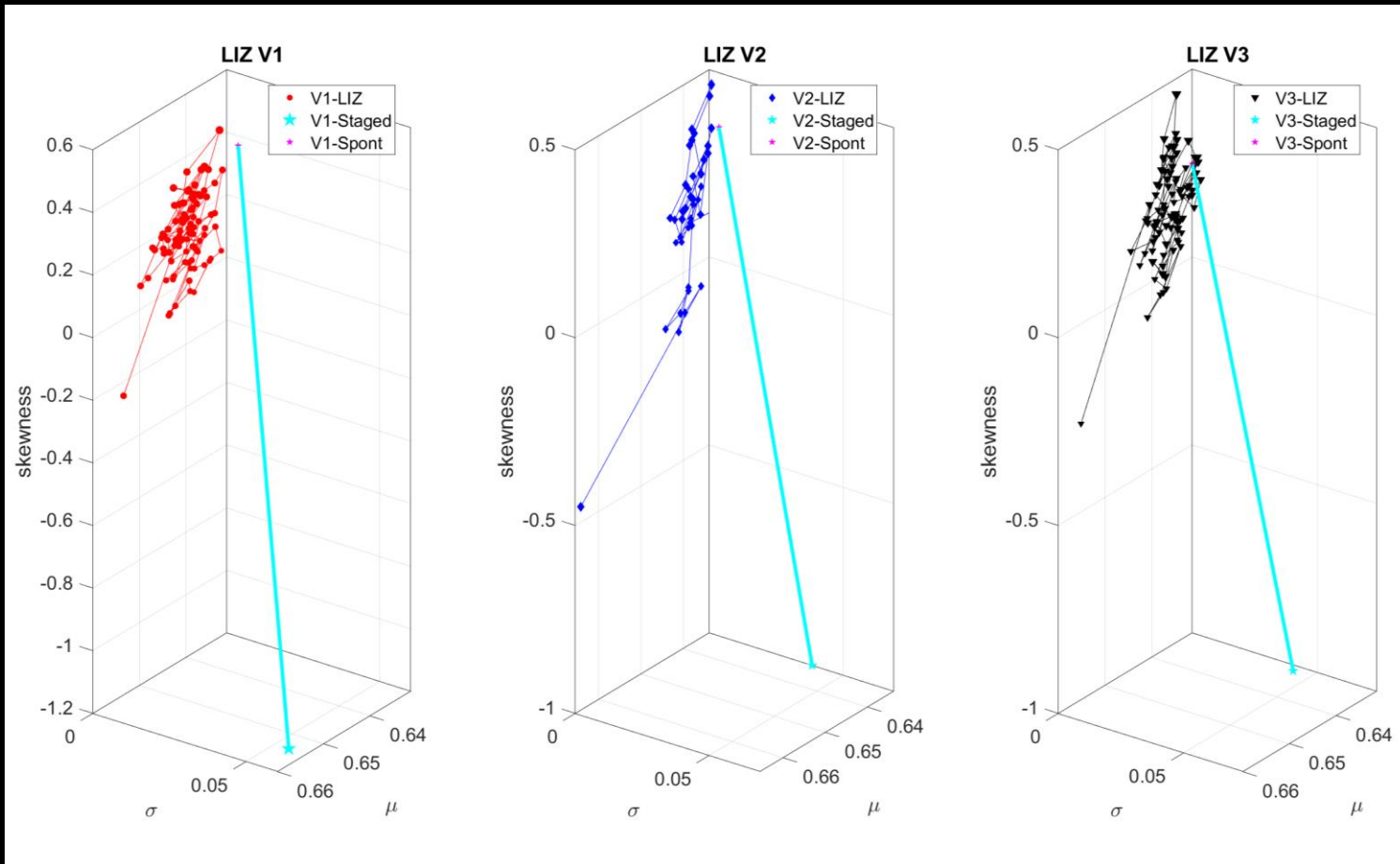
Mona

# Trajectories of V1-V2-V3 Ji



Ji

# Trajectories of V1-V2-V3 Liz



Liz