# Global Parenting Initiative

# Analysing Baby Jokes - An open test case for automated analysis of parent child interactions.

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## Introduction

Previously we trained a machine learning model to predict synchrony in parent-child interaction videos with 72% accuracy (Stamate et al. 2023). We're now developing further models to automatically analyse PCI videos for expert ratings of parental warmth, sensitivity, and responsiveness.

Due to ethical concerns and data protection issues, we created the BabyJokes project to share our code and methods openly with other researchers using an open demo dataset.
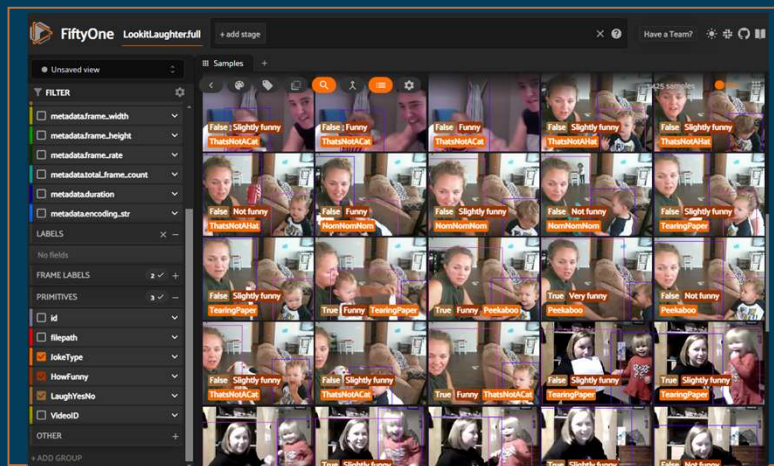


Figure 1: Video data and model classifications viewed in FiftyOne

## Motivation

Machine learning models must be trained on large datasets. PCI datasets are sensitive containing identifying information. This presents a challenge for open, reproducible science.

Our BabyJokes dataset and code base allow us to share a sample dataset together with data workflow and model training code.

## Models and code

All code for data pre-processing and model building open source

- Movement data extracted with YOLOv8
- Face recognition with DeepFace
- Speech recognition with Whisper
- Data visualisation with Voxel FiftyOne
- Docker container for security and reproducibility
- Code: github.com/infantlab/babyjokes

## Dataset

Video data were collected at home using the MIT's Lookit platform for a study of infant laughter (Addyman, in prep)

- Data sharing agreed
- 1425 x 5-15 second videos
- N=93 (54 f, av age 372 days, range 109-901)
- Five joke types, three repetitions (Peekaboo, Tearing Paper, NotACat, NotAHat, NomNomNom)
- Ratings of funniness & laughter [Yes, No]

## Conclusion

Dataset has many characteristics relevant to PCI assessment (turn taking, emotion, etc)

Open science approach allowed us work with international research team and run two hackathons with teams of AI experts at SAGE Plc.

Built complex data cleaning and pre-processing pipeline, tested feature extraction with SOTA models and evaluate ML models.