

# Video Analysis

**Yongjun Zhang, Ph.D.**

*Dept of Sociology and IACS*

*<https://yongjunzhang.com>*

# Today's Agenda

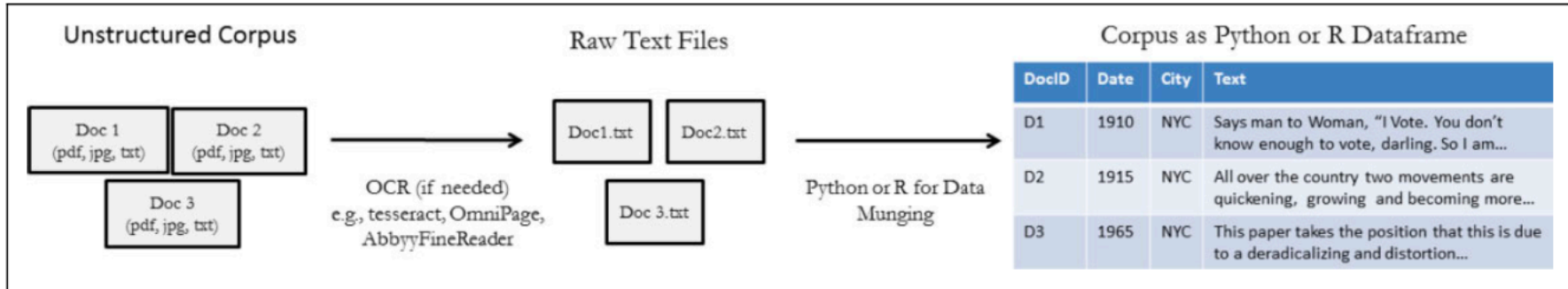
1. Mini Lecture (6:00-6:50PM)
2. Discussing Paper and How to Use Text, Image, Audio, and Video Data (7:20-8:20 PM)

# Proposing an Integrated Framework to Analyze Video as Data

**Video is a collection of frames  
(images) and audios.**

**Audio data is a collection of acoustic  
features and transcripts.**

# Text as Data



**Figure 1.** Corpus construction: From text to dataframe. This figure demonstrates a possible path from a collection of texts, saved in separate files, to a digital dataframe suitable for further computer-assisted text analysis techniques. Often historical texts are in the form of pdf or jpg images and thus require an intervening step using optical character recognition software. More contemporary texts are already digitized. Once digitized, the researcher can use Python or R to transform the separate files into one dataframe, with metadata attached to each text (in this example, date of publication and the city in which it was published).

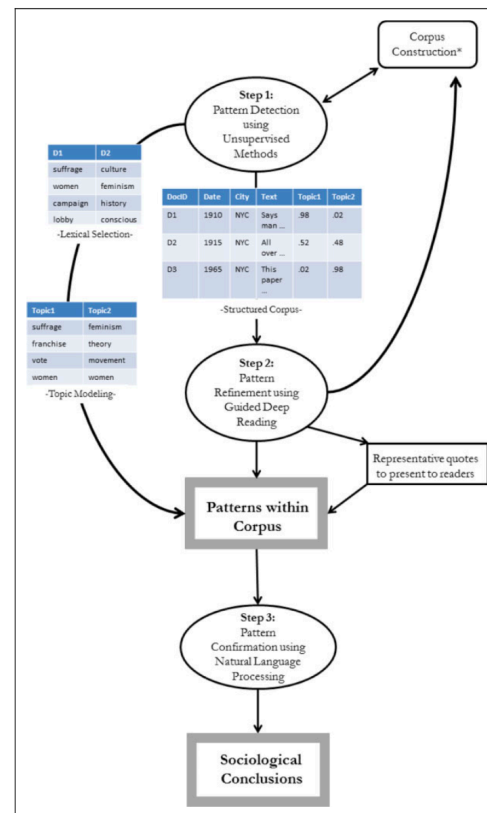
# Computational Grounded Theory: A Methodological Framework

Laura K. Nelson<sup>1</sup>

## Abstract

This article proposes a three-step methodological framework called computational grounded theory, which combines expert human knowledge and hermeneutic skills with the processing power and pattern recognition of computers, producing a more methodologically rigorous but interpretive approach to content analysis. The first, pattern detection step, involves inductive computational exploration of text, using techniques such as unsupervised machine learning and word scores to help researchers to see novel patterns in their data. The second, pattern refinement step, returns to an interpretive engagement with the data through qualitative deep reading or further exploration of the data. The third, pattern confirmation step, assesses the inductively identified patterns using further computational and natural language processing techniques. The result is an efficient, rigorous, and fully reproducible computational grounded theory. This framework can be applied to any qualitative text as data, including transcribed speeches, interviews, open-ended survey data, or ethnographic field notes, and can address many potential research questions.

Sociological Methods & Research  
1-40  
© The Author(s) 2017  
Reprints and permission:  
sagepub.com/journalsPermissions.nav  
DOI: 10.1177/0049124117729703  
journals.sagepub.com/home/smr  

**Figure 2.** Three-step computational grounded theory framework: From dataframe to conclusion. This figure graphically represents the three-step computational grounded theory process. Step 1 serves two purposes: It outputs interpretable lists of

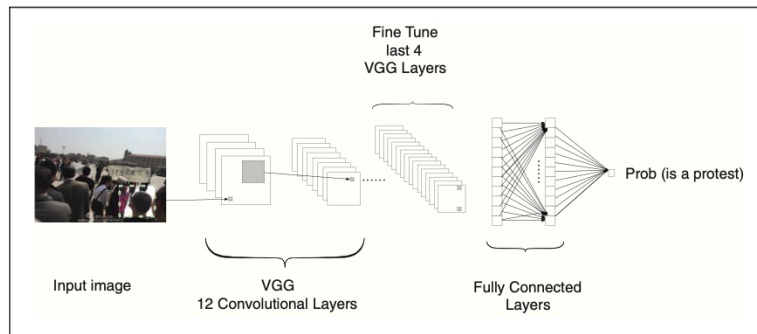
# Image as Data

1

Sociological Methodology  
2019, Vol. 49(1) 1–57  
© American Sociological Association 2019  
DOI: 10.1177/0081175019860244  
<http://sm.sagepub.com>  
SAGE

## CASM: A DEEP-LEARNING APPROACH FOR IDENTIFYING COLLECTIVE ACTION EVENTS WITH TEXT AND IMAGE DATA FROM SOCIAL MEDIA

Han Zhang\*<sup>ID</sup>  
Jennifer Pan<sup>†</sup>

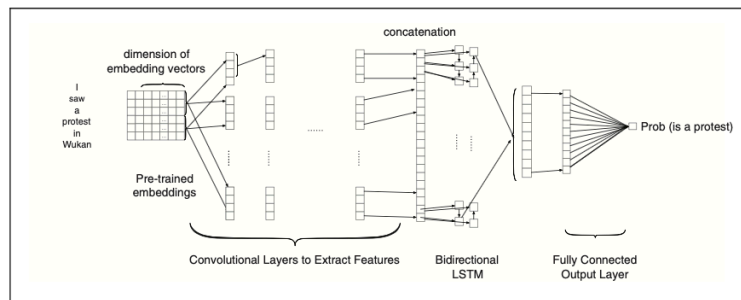


**Figure 1.** Illustration of our convolutional neural network architecture for image classification.

*Note.* Input image from Weibo.com.

Collective Action from Social Media

15



**Figure 2.** Illustration of our convolutional and recurrent neural networks with long short-term memory architecture for text classification.

*Note.* LSTM = long short-term memory.

# Audio as Data

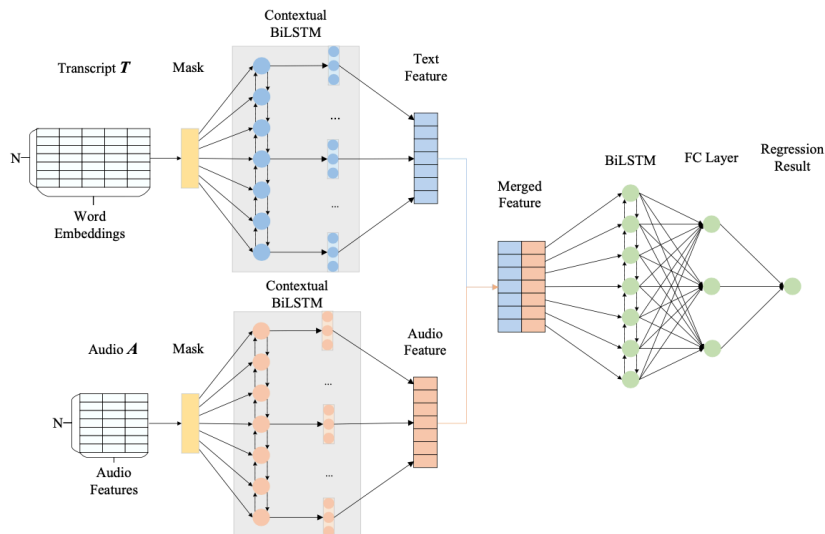
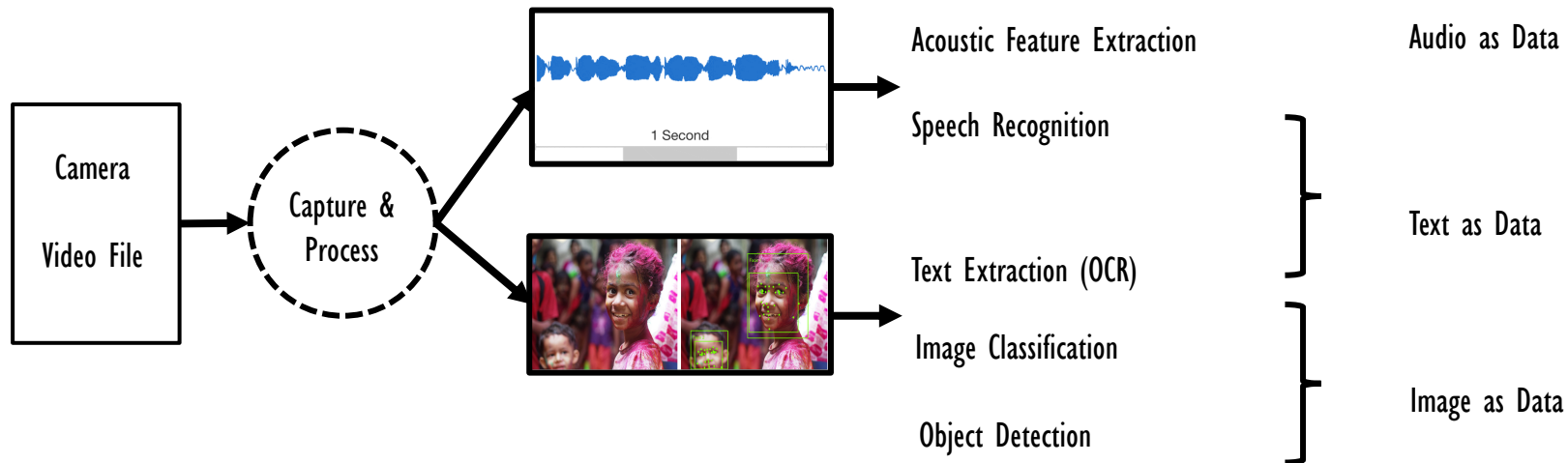


Figure 1: The proposed Multimodal Deep Regression Model (MDRM). The inputs to the model is a company's conference call audio file with corresponding transcript. Each conference call consists of  $N$  sentences. The output variable is a numerical value, i.e., the company's stock price volatility following the conference call.



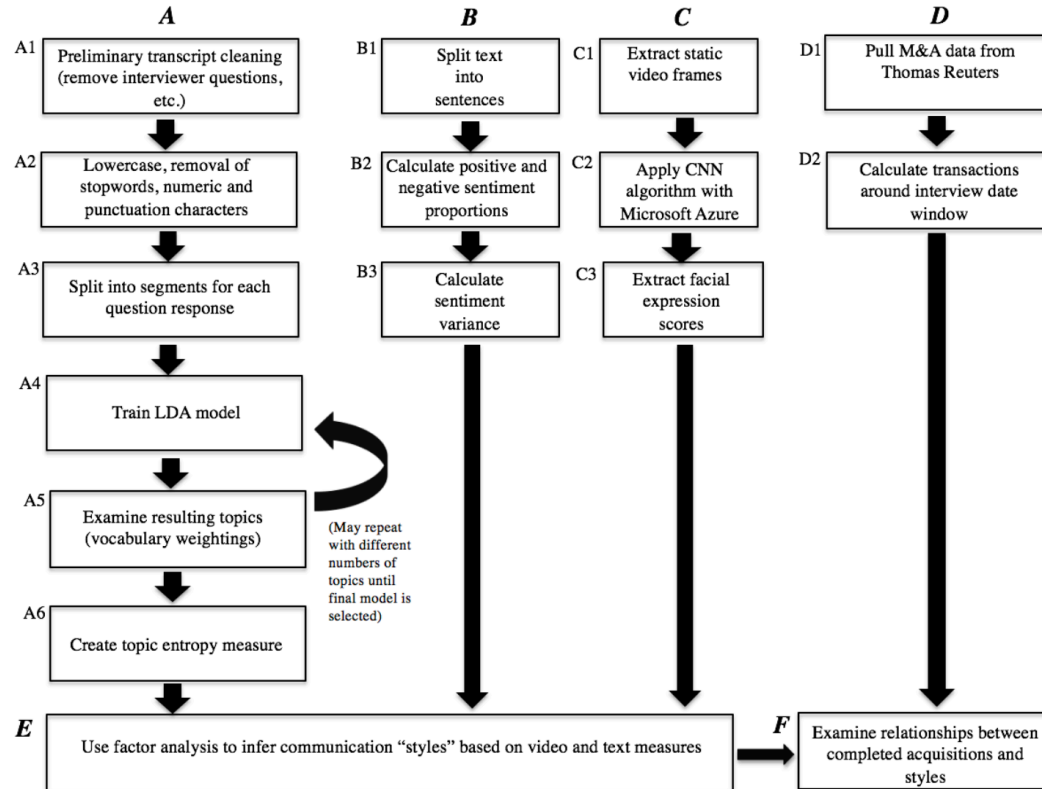
# Video as Data



# **Machine Learning Approaches to Facial and Text Analysis: Discovering CEO Oral Communication Styles**

**Raj Choudhury, Dan Wang, Natalie Carlson, and Tarun Khanna**

Figure 1. Overview of Methodological Approach



# Thank you!

*Yongjun Zhang, Ph.D*  
*Assistant Professor*  
*Dept of Sociology and*  
*Institute for Advanced Computational Science*  
*Stony Brook University*  
*Yongjun.Zhang@stonybrook.edu*  
*<https://yongjunzhang.com>*