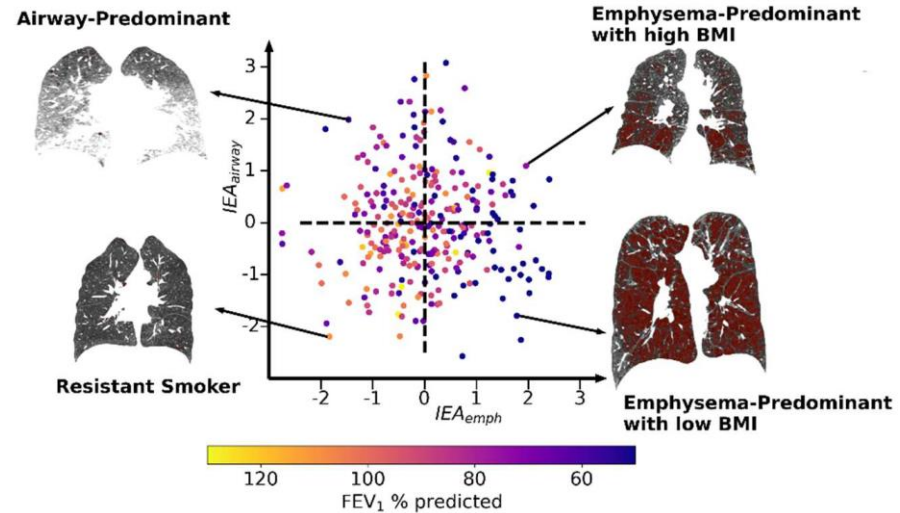# COPD subtyping with Integration of Chest CT Imaging and Gene Expression

## Junxiang Chen, Li Sun, Ke Yu, and Kayhan Batmanghelich

- Chronic obstructive pulmonary disease (COPD) is a common disease that is widely accepted as a heterogeneous condition of multiple subtypes.

- In this project, we analyzed COPD subtypes with an integration analysis of chest CT imaging and gene expression.

- We identified two distinct Image-Expression Axes (IEAs) that characterize different inflammatory processes associated with emphysema and airway predominant COPD.

Airway-Predominant

Emphysema-Predominant with high BMI

Resistant Smoker

Emphysema-Predominant with low BMI

IEA_{airway} / IEA_{emph}

FEV$_1$ % predicted

Chen, Junxiang, Zhonghui Xu, Li Sun, Ke Yu, Craig P. Hersh, Adel Boueiz, John Hokanson, Frank C. Sciurba, Edwin K. Silverman, Peter J. Castaldi, Kayhan Batmanghelich. " Deep Learning Integration of Chest CT Imaging and Gene Expression Identifies Novel Aspects of COPD." [preprint, submitted to American Journal of Respiratory and Critical Care Medicine]. 2022. Available from: https://doi.org/10.1101/2022.09.26.22280242.

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Identifying the Influence of Gender Stereotypes on Public Reactions to Elite Athletes with Mental Health
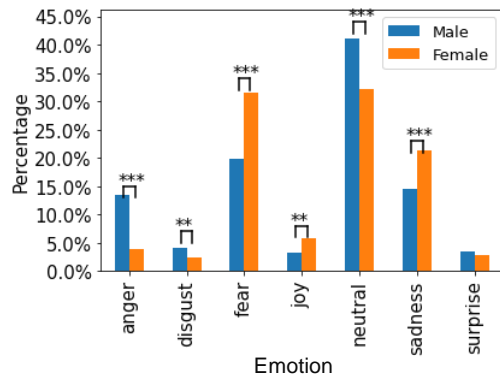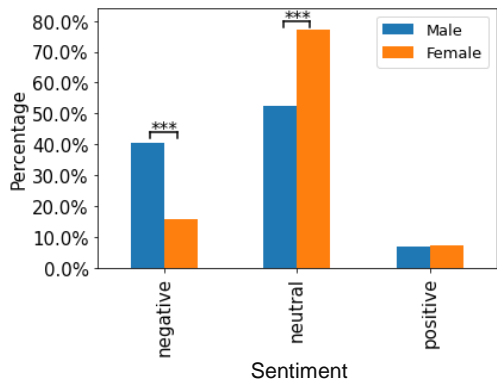
"***" represents the p-value is <0.001.
"**" represents the p-value <0.01

- The project aims to understand the different expectations and emotional responses of the public to male vs. female athletes.

- We collect tweets related to ten elite athletes who stepped off their field of play due to mental health reasons.

- We conducted a sentiment and an emotion analysis for the tweets.

- The results show that Twitter users responded differently to males versus females, likely due to gender stereotypes.

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