Universe of Mental Health in Tech Company

Yangyang Zhu

School of Digital Media &
Design Arts, BUPT

Suwen Li

School of Digital Media &
Design Arts, BUPT
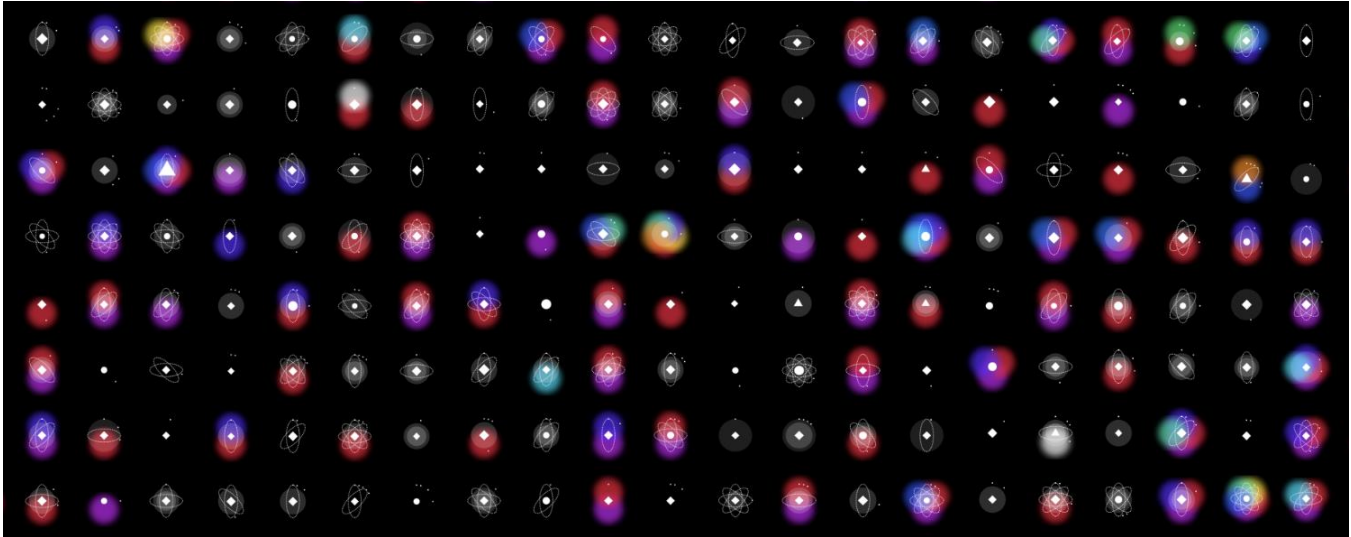
Wei Zhou

School of Digital Media &
Design Arts, BUPT

Tiemeng Li*

School of Digital Media &
Design Arts, BUPT

Beijing Key Laboratory of
Network System and Network
Culture

ABSTRACT

Employees in tech companies are under enormous pressure due to their high intensity work. But many tech companies don't take mental health issues seriously. To remind tech companies to pay attention to the mental health of their employee, we visualized a questionnaire on the mental health of employees in tech companies conducted by OSMI. In our design, the employees of technology companies are metaphorically the stars in the vast universe; the position of the stars in the sky are determined by the result of vectorized data's dimension reduction. Combining the overview and detail views, we found some notable groups and stories. Finally, we published a website, which allows users to explore data freely through interactive operations.

Keywords: Mental Health, Tech Company, Art Visualization, Visual narration, Discrimination.

1 INTRODUCTION

Open Sourcing Mental Illness(OSMI) is a non-profit charity that helps employers and employees in tech companies promote and improve mental health issue through awareness education of mental health. To help the public understand the mental health of employees in tech companies, we visualized the questionnaire conducted by

* tiemeng2000@gmail.com

OSMI in 2016 [1]. Our work includes data cleaning, data analysis, design and development of visualization system.

In our design, the employees of technology companies are metaphorically the stars in the vast universe. The brighter the stars are, the more illnesses employees suffer from. Despite suffering from psychological diseases, they are still afraid to seek help or talk to their boss and colleagues, because they don't want to be dismissed or discriminated.

2 DATA ANALYSIS

2.1 Data Cleaning

Respondents were divided into seven groups through four questions in the questionnaire, and different questions are put forward according to the working status of different groups, as shown in figure 1. Because the main subjects of the questionnaire are technology companies, we abandoned the answers irrelevant to the technological jobs.
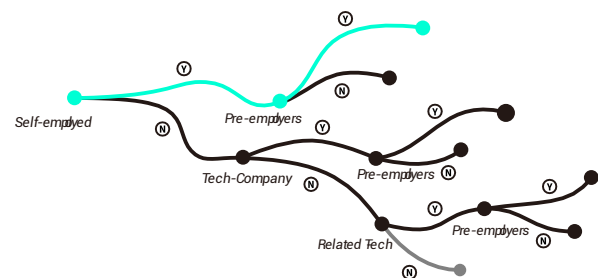

Figure 1: Questionnaire structure.

2.2 Data Analysis

We used one-hot coding to convert text data into vectors, and t-SNE dimension reduction algorithm to convert multidimensional data to two-dimensional data [2]. We mapped data to a plane according to their two-dimensional coordinates, where an obvious clustering pattern can be found, as shown in figure 2. Next, we drew the stars in the night sky according to the positions in the figure.
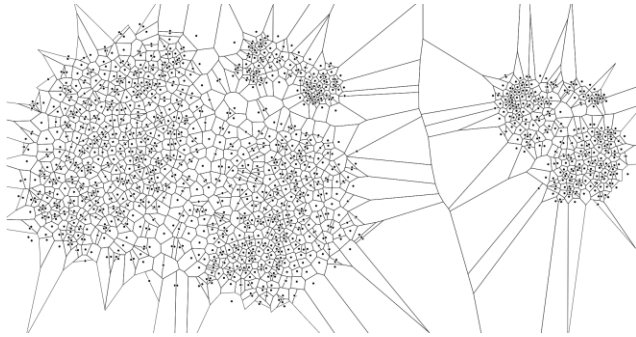

Figure 2: Clustering results.

3 DESIGN PROCESS

3.1 Overview

We used a metaphor of the starry sky, and each individual is like a twinkling or steadily shining star in the night. Each star tells its own story. We imagined that the starry sky is like a canvas full of stories. The concept that people use the twinkling stars to emit gravitational waves to transmit information in the science fiction *The Three-Body Problem*, and the idea of the stable star loop also comes from the idea in this novel.

We took the questions about discrimination as the index (Do you think that team members/co-workers would view you more negatively if they knew you suffered from a mental health issue?) to reflect everyone's view of the working environment. Twinkling stars represent individuals with negative views, and stars with stable rings represent individuals with positive views, as shown in figure 3 [3][4].

Figure 3: Overview.

3.2 Detail

We mapped the employees' conditions to the 12 colors, as shown in Table 1. The shape of the planet's core represents gender; the size of the core represents age; the inclination of the track represents benefit offered by the company; the ring represents whom to talk to; the position of the satellite represents job position[5].

Table 1: a) Conditions; b) Positions

	Conditions			Positions
1	Mood Disorder (Depression, Bipolar Disorder, etc)	●	1	Back-end Developer
2	Anxiety Disorder (Generalized, Social, Phobia, etc)	●	2	Front-end Developer
3	Attention Deficit Hyperactivity Disorder	●	3	Supervisor/Team Lead
4	Post-traumatic Stress Disorder	●	4	DevOps/SysAdmin
5	Obsessive-Compulsive Disorder	●	5	Support
6	Substance Use Disorder	●	6	One-person shop
7	Personality Disorder (Borderline, Antisocial, Paranoid, etc)	●	7	Designer
8	Stress Response Syndromes	●	8	Dev Evangelist/Advocate
9	Addictive Disorder	●	9	Executive Leadership
10	Eating Disorder (Anorexia, Bulimia, etc)	●	10	Sales
11	Dissociative Disorder	●	11	HR
12	Psychotic Disorder (Schizophrenia, Schizoaffective, etc)	●	12	Other

4 DISCUSSION

We found most respondents suffer from two illnesses at the same time - emotional disorder and anxiety disorder, and people who have resigned are more likely to get sick. People who have been sick are more sensitive to the company's ability to accommodate people with mental illness.

Among those who believe they will not be discriminated against, they are willing to talk to others about their mental health problems because their companies have comprehensive mental health benefits, while people who believe they will be discriminated against usually work in companies with inadequate mental health benefits.

Some younger employees, having not changed jobs, are reluctant to talk with colleagues and supervisor about their mental health issues, and their companies' welfare are also inadequate, as shown in figure 4.
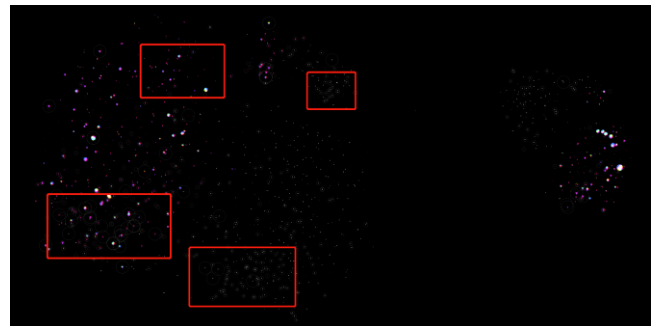

Figure 4: Some notable groups.

5 CONCLUSION

The work enthusiasm of employees is closely related to their company's mental health welfare, and this is directly showed by whether they are willing to talk to their employers and other aspects. As the employer, the company should guide the employees to actively talk about mental health issues, provide necessary mental health welfare in order to prevent the employees from mental illness.

REFERENCES

[1] Data: https://osmihelp.org/research/
[2] Scikit-learn. https://scikit-learn.org/
[3] Casey Reas,Bend Fry.Processing: A Programming Handbook for Visual Designers and Artists[M].Publishing House of Electronic Industry,2019.
[4] p5.js. https://p5js.org/
[5] D3.js - Data-Driven Documents. https://d3js.org/