National Taipei University of Technology

Computer Science and Information Engineering

Principles and Applications of Data Science

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Semester Group Project Proposal

The relationship between temperature, humidity and human stress

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**Introduction:**

**Motivation:**

New York Times have written the article, << His College Knew of His Despair. His Parents Didn’t, Until It Was Too Late.>>, using “despair” to talking about the university students in America may experience. And as we realized that there are much people suffer from Depression or Bipolar Disorder in our daily life. We want to found that if there is something we can do before these happens. We start to search for human stress, and two papers written by L. Rachakonda, S. P. Mohanty, E. Kougianos, and P. Sundaravadivel were found. They create an IoT device which can detect the data from human body that can help to detect the stress immediately. We used the data provided by this project to create a model which can predict the human stress by temperature and humidity.

I found that most of them have some common personality, they suffer a big stress at the end, but they are not conscious of when these stresses started. We hoped that we can create a model which can predict the stress, by this way, people may can do something relaxing at the beginning to make these stress don’t grow larger and larger.

**Objectives:**

Create a model which can predict the human stress by temperature and humidity data.

Although the temperature and humidity are the body temperature and humidity in these papers, we’ve known that the weather will also influence the frequency of symptoms, which called “Seasonal affective disorder (SAD)”.

**Project Plan and Deadlines:**

**Related Work and Resources:**

* L. Rachakonda, S. P. Mohanty, E. Kougianos, and P. Sundaravadivel collected the data from IoT devices. These data classified the stress to three levels, and higher level means higher stress.
* Analyze these data, see their relationship:
  1. Draw the scatter graph to see the distribution.
  2. Use correlation coefficient to check if they have relationship.
* Use different algorithm(Supervised learning) to create the model

1. Use K-NN algorithm to create a predictable model and calculate the accuracy.
2. Use SVM algorithm to create a predictable model and calculate the accuracy.
3. Use Decision Tree algorithm to create a predictable model and calculate the accuracy.
4. Use the data of humidity and temperature from Taiwan to see the prediction of stress level in a year.

**Methodology:**

1. correlation coefficient
2. K-NN
3. SVM
4. Decision Tree

**Tools:**

1. Jupyter notebook
2. Python Library

**Expected Results:**

1. Analyze the relationship between temperature, humidity and stress.
2. Create a model which can use temperature and humidity to predict the stress level.

**Timeline:**

3/10 discuss project plan

3/17 environment setting

3/27 plots data directly and analyze

4/02 k-nn done

4/07

4/20

6/15