

Empathetic Technology in Workplace Environment

Monica Gullapalli, Yadnyesh Mahadeshwar, Mitali Rathod, Ajay Sharma, Amol Dapkekar

Department of Engineering Sciences and Humanities
Thakur College of Engineering and Technology (TCET)
Kandivali East, Mumbai

monicagullapalli@gmail.com, yadnyesh.mahadeshwar@gmail.com, mitalirathodft9@gmail.com, ajaypawansharma@gmail.com, amol.dapkekar@gmail.com

Abstract – Empathy and Technology going hand in hand is an unpredictable combination. We might think that we are capable of hiding our emotions, our internal conflicts, our constant battles but maybe we don't and this technology is at its best foot forward to help us understand how our bodies react to situations either knowingly or unknowingly. People spend most of their lifetime in office cubicles and cabins thus falling prey to work pressure. Empathetic technology can help in reducing mental stress on employees thus increasing their productivity and efficiency that would in return help the progress of the company and the country in the long run.

Keywords – Empathetic Technology, Mental Health, Work-life Balance.

I. INTRODUCTION

The idea of empathetic technology brings in a higher standard of technology that involves human emotions into the game, it involves a great combination of simply-complicated human emotions with the AI (artificial intelligence). As the name speaks for itself, empathetic technology primarily focuses on the basic human emotions and understanding them properly not only through human connect but with technology advancing into it. For example, slight changes in our body might not have a conversation with the person standing in front of us, but the technology has developed so much so as to help us speak more involuntarily than voluntarily. The idea of monitoring mental health in workplace is solely because of the fact that a toxic work environment can be corrosive to our mental health. It's time we protect those with mental crisis overhead and reduce the risk of letting them fall prey to this. We cannot afford to lose the asset of a nation to mental illness. Most of the youth of our nation is found in offices and empathetic technology is an attempt to make their workplace feel comfortable towards them and they feel more friendly and attached to their surroundings. This would in return increase the performance of an employee as an individual. Maybe, we speak more than we can hear, the new technology has upgraded itself so much that it can detect the slightest changes in our body.

II. LITERATURE REVIEW

Poppy Crum, the chief scientist at Dolby Laboratories in San Francisco, CA, an adjunct professor at Stanford University in the Centre for Computer Research in Music and Acoustics has given a ted talk on empathetic technology where she presents empathetic technology as "technology that is using our internal state to decide how

it will respond and make decisions". Empathetic technology has been implemented prior with lesser emphasis on its capability into VR (virtual reality) and AR (augmented reality). These have themselves been great implications of the technology but this time the technology is prepared to escalate to a whole new level by manifesting itself in the form of sensors that can solve the existential crisis regarding health conditions of employees in their workplace. The idea of empathy and technology together is tried to be rooted into children's educational curriculum in a few countries such as Denmark. This would not only evoke their empathy in times of need but also expand it. Moreover, this technology can be implemented in real-time, adding on to the research conducted by WHO (World Health Organization) already.

III. COMPARATIVE STUDY

1. What is empathy?

The word empathy primarily focuses on a quality that involves shifting of our point of views in the same perspective as that of the protagonist of a situation. It is a personal virtue that we possess as an individual to view a particular situation from someone else's point of view. It's more like stepping into someone's shoes and feeling what they feel.

2. Emotions, Technology and Design

• Emotions

The intervention of technology into human connect is itself a landmark. The idea of introducing human values into electronic equipment and devices involves all the latest technology. This new idea of using technology to understand human emotions would need upgraded technology as a must but it would also require acceptance from humans too because this technology reads their internal states and biological experiences and understands the hidden emotions behind the poker face we put on. It

manifests the slightest changes in their facial expressions and shows us the backend process of the result.

• **The Technology**

1. **Pupil sensing:**

In this we use pupil dilation sensors. When our pupil is dilated, our brain works harder, whereas when our brain experiences less stress the pupil contracts.

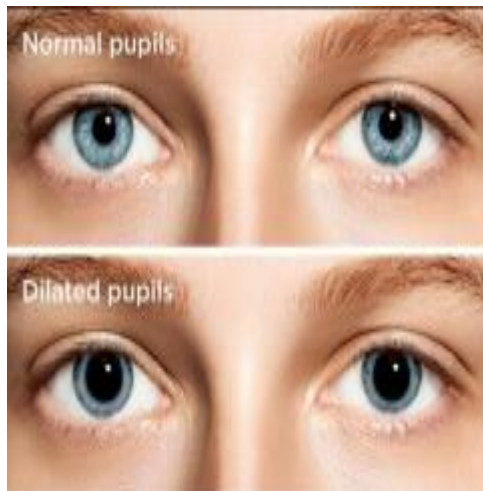


Fig.1. Pupil Dilation.

2. **Radiation sensing:**

The thermal responses from people give away information like change in stress, how hard their brain is working, it even tells us if the person is attentive or not.

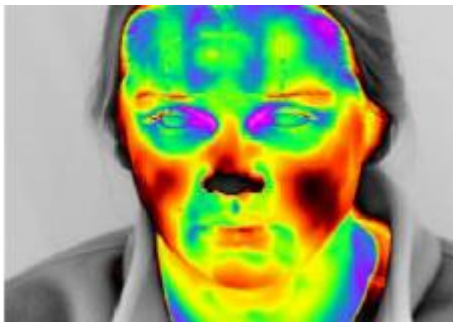


Fig.2. Radiation Sensing.

Example: When people see fire or an image of fire they release heat from their cheeks.

3. **LBPH:**

LBPH (Local binary patterns histograms algorithm) is a face recognition algorithm which we will use to capture the human feeling and emotions.

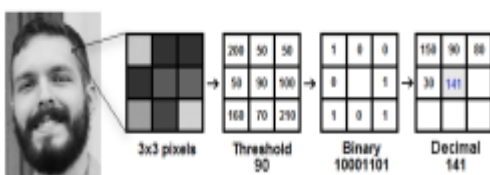


Fig.3 Algorithm LBPH.

• **Design**

The main design or model is that we install cameras with LBPH in the laptops or desktops in cubicles, so that they can constantly read the employee's face and collect data from it. We can modify the cameras so that they can study the pupil dilation and thermal images as well, hence giving us information about the stress or load on an employee's brain while he is performing a task.

3. **What is workplace environment?**

An average person spends around over one-third of his life at work. The space they are exposed to while working isn't just about their table and the laptop, it's about their surroundings, the entire environment they are in. Their spaces should be friendly and interactive enough to keep them rid of mental stress. Work-life balance isn't a small thing anymore, it's the deciding factor of a company's progress and growth rate. Workplace environment is the key element to both of these factors.

4. **Lifestyle and Environment**

There lies a deep-rooted connection between both of these terms. The environment a person is exposed to live in has a very strong influence on the person's lifestyle. Both the factors are like the sides of a coin. By carefully reading a lot of experiments prior conducted by people in their workplace, it is noticeable that a change in the office environment brings in a change in people's lifestyles also. There are studies that explain this phenomenon of changing dimensions in offices. A lot of people change the things arranged in their cabins or cubicles as per their feasibility because that's what they are comfortable with. And also, few people keep changing the positioning and arrangement of things in their cabins after certain time intervals because it welcomes a wave of positive energy which in turn influences their work and the productivity of the task assigned to them. They start feeling vibrant and more active as they respond to the changes and this reflects in their internal states and overall behavior.

5. **How Empathetic Technology can contribute to health issues in workplace?**

The intervention of technology into human connect is itself a landmark. Looking ahead of this, it would be beneficial if empathetic technology comes into play and converts the micro changes in our expressions to electrically readable data by the computers. This very idea can be of great help in offices and workplace because then a particular employee can be evaluated emotionally and can be assigned work accordingly for the day. Even if a person is facing some mental crisis, this technology can help us know about it prior and help do the needful. Considering the capabilities of empathetic technology, it can be programmed in computers, connected sensors and can be placed in offices and cabins of the employees to track their mood and the presence of mental issues if any. This can be done by using sensors that can track the composition of our breath as we exhale. This data can be

used to decide about the stress levels in one's body at a particular time. The chemical composition of our breathe gives away our feelings.

In a TED|2018 talk by Poppy Crum, she used these sensors in the auditorium and baffled the audience by tracking the overall composition of their breath exhale. So, this can be done on a larger scale as well. This technology can be used to study all the feelings we exhibit involuntarily at every moment of our lives differing with difference in situations.

This composition of breath changes when our heart speeds up, or our muscles tense and all without any obvious changes in our behavior. By the use of sensors, we can track a person's individual or a group of individuals' collective emotional giveaway. The data recorded by these sensors can be displayed in the boss' or in the room of a higher authority on a computer in a readable form who with a peaceful mind can study the information and report the mood meters to the person in-charge of assigning work to the employees. Constant analysis of the data tracked and if put to use properly can help speed up the progress of the company.

6. Present time usage of empathetic technology

- The technology can be used to understand the internal states of animals like their experiences, their biological states and other signals that they give out in response to what they are exposed to in the world.
- Recording and studying the slightest changes in our expressions like pupil dilation. It has been observed on experimental basis that the pupil of our eye dilates when our mind is having to work harder. Our autonomic nervous system drives our pupil to dilate. And when our mind does not have to work hard, it contracts. This can be used to understand if the information given to an individual is causing stress on him/her or not.
- We can record the changes in our body from changes in the temperature of our physiology. This was observed while studying sets of infrared thermal images of human faces and their thermal response, and changes in our stress levels, how hard our brain is working, when one is shown a picture of fire. It was observed that people give out heat from their cheeks as a response to the image of flame.
- We can track the honesty of someone's feelings and someone's interpersonal interests with the help of their thermal image. This can escalate the idea of falling in love and viewing attraction.
- This technology can give insights and make predictions about our physical and mental health just by analyzing the timing dynamics of our speech and language picked up by microphones.
- This technology can be used to detect symptoms of diseases around ten years before their clinical diagnosis. Dementia, Diabetes can alter the spectral coloration of our voice. Changes in our language

associated with the Alzheimer's can be predicted by using this technology years before its actual clinical diagnosis.

- This technology can be used to expand other technologies like Augmented Reality (AR) and can root us to a deeper level.

7. Benefits that would come into play with use of Empathetic Technology in workplaces

- The employees would feel cared for and will feel happy about getting work according to their mental state of mind.
- The use of empathetic technology in the form of sensors for the employees can take the tasks of the HR department to a whole new level where the department not focuses only on paper work and skills but also the state of their mind as an individual.
- The employees would have a balanced work-life than ever before and this can solve one of the most difficult yet pending crisis of the entire world regarding employee and customer satisfaction.
- These sensors can also detect changes in stress levels and difficulty when spoken about a particular topic. Once the employees are treated as individuals and not as an employee, this technology can be of very much help as the company can also alert the family members of the individual if there is something serious coming their way.
- Apart from all other benefits that any ordinary employee would receive, infusing this technology into their lives can bring about a change in the way they see and pursue work at their place.
- By taking feedbacks from the employees regarding certain topics and using these sensors side by side, the company can also organize a few events or so to raise the bar of productivity.
- Their ordinary workplace would no longer be boring and modest, it would be more friendly and welcoming and the employees would feel a much higher level of satisfaction and it would remove the myth revolving around the normal nine to five job.

IV. FUTURE SCOPE

Apart from all the benefits suggested for use in real-time, there can be a variety of future uses for this technology.

1. Substitute to lie detectors

The sensors that have been developed with the help of empathetic technology are definitely a beneficial substitute to lie detectors. The usage of these sensors wouldn't seek permission from the government and the usage is also very safe and friendly unlike lie detectors that tie up an individual to the chair with lots of individual devices and a monitor surrounding him/her. The data can also be easily read from the sensor displayed in a readable form on the computer than reading data from the polygraph as displayed by the lie detector.

2. Cabins of counsellors, psychiatrists and psychologists

We might get invaluable emotional feedback if these sensors are placed in cabins of counsellors and psychiatrists. They can record the data given out by these sensors when the patients are asked questions about themselves. The amount of stress they lay on their minds while responding to these questions can reveal a lot about their inner states and mental capabilities. By this method, we might reduce the number of suicides committed.

3. Improvement in training and development

Every big company has an HR department. The HR department is responsible for managing resources related to employees. It is also responsible for training and development of its employees. The data received from these sensors and devices can be of great help to the HR department of a company. They can analyze and rectify the areas in which an employee is lacking. They can find out the weaknesses and train their employees accordingly.

4. Better recruitment options

The HR department also looks after the recruitment needs of a company. Their job also includes determining when recruitment is necessary in each department as well as if the hire is of benefit to the company. When a candidate is being interviewed for a job, these empathetic technology equipped sensors can help detect the mental health of the candidate and feed the interviewers data about how much stress is the candidate under during questioning, whether he/she can handle the work pressure and whether or not the candidate is suitable for the job.

V. RESULT AND CONCLUSION

Empathetic technology can help us know more about ourselves than ever before. This technology is an answer to a few most important technological-crisis around the world. This technology opens up a new dimension of human connect. This technology just as any other comes with its own advantages and disadvantages. This technology is a blessing for employees facing issues daily in their workplace. Especially for interns who face a lot of trouble trying to fit into their workplaces. It is also a good investment for companies as it becomes easy for them to keep track records of the performance and mental state of their employees. Apart from professional benefits, empathetic technology can also enhance personal relationships amongst colleagues. This technology doesn't look up to creating a world where our inner lives are ripped open for the world to see. But it looks forward to making a world where transparency is the key idea and people can be more empathetic towards each other than they ever were. It's not looking forward to disclose data to the world that we actively do not choose to share. This technology is stepping forward to make a world where we can care about each other more effectively and can have richer experiences with the technology.

VI. ACKNOWLEDGMENT

A whole hearted thank you to our mentor, our guide prof. Amol Dapkekar. Thank you to all the student members and other teaching staff of the ES&H (Engineering Sciences and Humanities) department of Thakur College of Engineering and Technology (TCET) involved in this research.

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