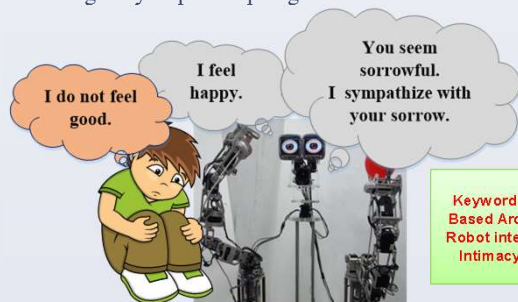


## Abstract

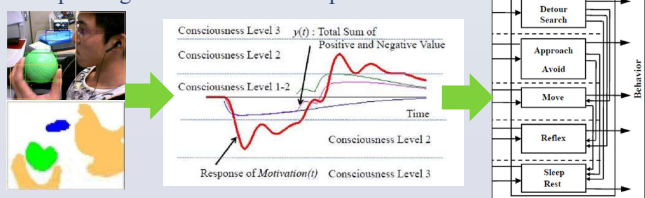
This poster presents the cognitive process of the animal robot with emotional intimacy when robot recognizes a human. The robot behavior was built based on hierarchical artificial consciousness depending on its motivation. The point of this poster is emotional intimacy of robot when robot interacts with a human. Since the robot has an interpersonal relationship of emotion, a robot would have a closer relationship and trust. This paper focuses on three points in the development of our proposed framework: (1) the organization of the behavior including inside-state emotion regarding the phylogenetic consciousness-based architecture; (2) the method whereby the robot can have empathy toward its human user's expressions of emotion; and (3) a method that enables the robot to select a facial expression in response to user's expression, based on biologically inspired topological online method.



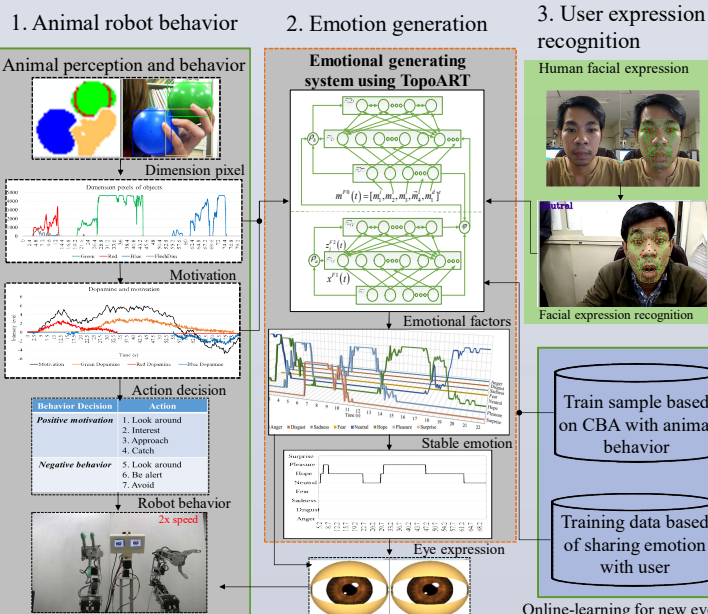
**Keywords:** Consciousness Based Architecture, Human-Robot interaction, Emotional Intimacy, Robot Behavior

## Background - Robotic System that Imitates Animal Consciousness

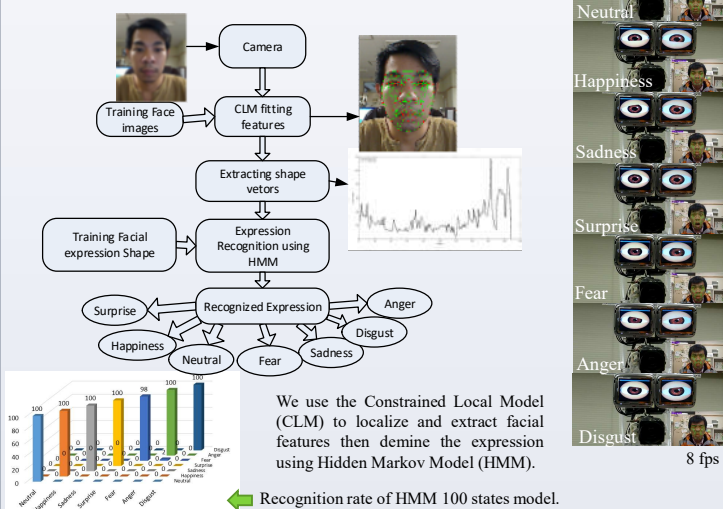
Firstly, we built the robot to imitates an animal behavior based on the motivation and synthetics neurotransmitter represented by dopamine. the robot create and motivation and dopamine when it recognize the object surrounding. The robot then performs its behavior and emotion depending on motivation and dopamine.



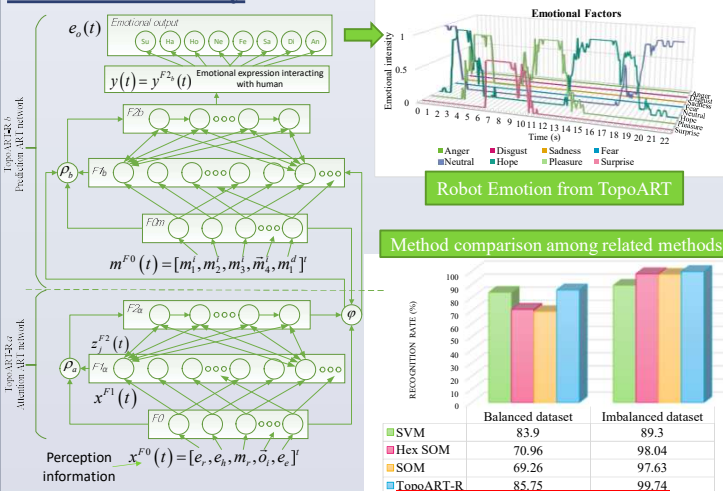
## Overview of the Robot System



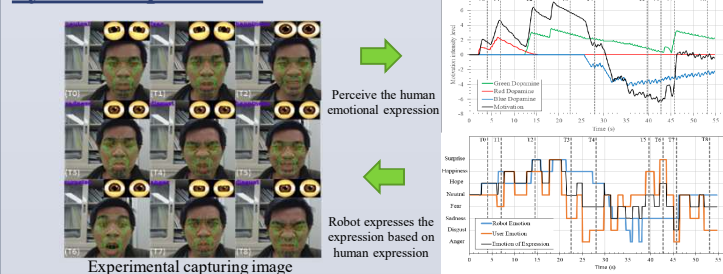
## Facial Expression Recognition



## Emotional Generation using Topological Adaptive Resonance Theory



## System Experiment



## Conclusion

This poster presents the system of the cognitive behavior robot and emotional sharing between an inside state of the robot and user's expression by face-to-face. Our preliminary evaluation demonstrates that the robot can perform its behavior and inner emotion depending on the dopamine and motivation. When the robot can recognize a user, it can present the expression that is regulated by sharing the robot emotion and user's expression to avoid an emotional conflict. Where the system implemented the hierarchical consciousness based on the motivation model, facial expression recognition, and emotional generation using an incremental on-line learning algorithm to allow the robot can learn the new pattern continuously based on the consciousness aspect.

## Contact us

Sakmongkon Chumkamon ([s.chumkamon.jp@ieee.org](mailto:s.chumkamon.jp@ieee.org))