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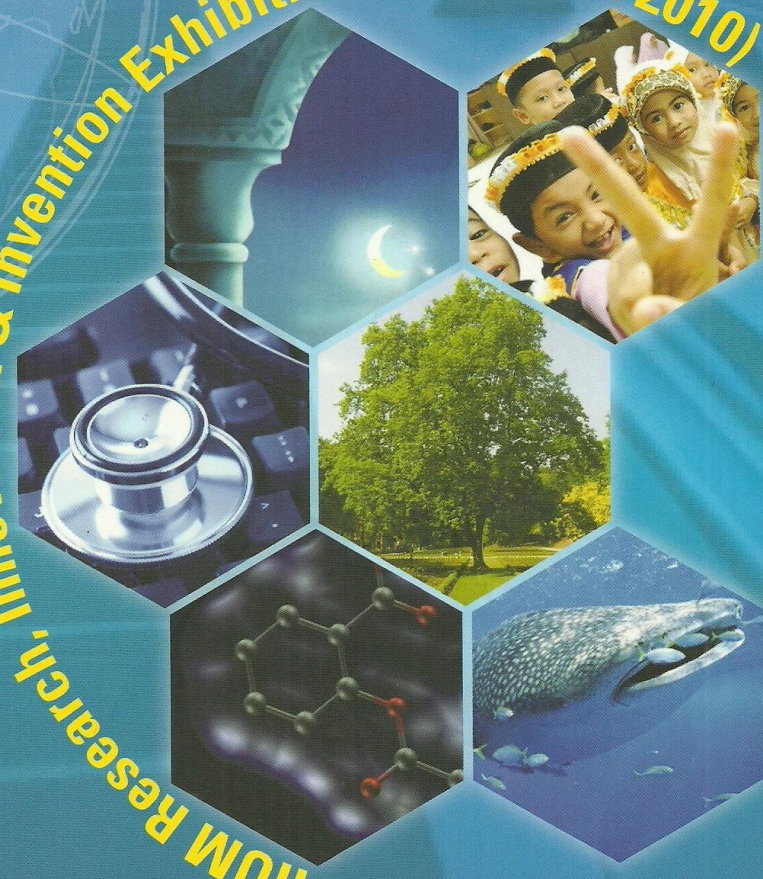

ENHANCING QUALITY RESEARCH &

INNOVATION for SOCIETAL DEVELOPMENT

determined by using 10 wt% KF at temperature of 180°C and screw rotation of 150 rpm. The theoretical tensile strength and tensile modulus was also predicted by using parallel rule of mixture and the value then compared with the value obtained via experimental.

P-17 Lattice models with interactions on Caylay tree

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We consider an Ising competitive model defined over a triangular Husimi tree where loops, responsible for an explicit frustration, are even allowed. We first analyze the phase diagram of the model with fixed couplings in which a "gas of noninteracting dimmers (or spin liquid) — ferro or antiferromagnetic ordered state" zero temperature transition is recognized in the frustrated regions. Then we introduce the disorder for studying the spin glass version of the model: the triangular ±J model. We find out that, for any finite value of the averaged couplings, the model exhibits always a finite temperature phase transition even in the frustrated regions, where the transition turns out to be a glassy transition. On the other hand, In this investigation we studied one-dimensional countable state p-adic Potts model. We prove the existence of generalized p-adic Gibbs measures for the given model. It is also shown that under the condition there may occur a phase transition.

P-20 Socially Interactive Humanoid Head

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Due to rapid development of technology, robots are entering and influencing the human life into its social paradigm breaking out from its confinement within industrial applications. As a consequence, research on social robotics is on surge globally. Social robotics is a specific field of robotics where robots engage in interaction and communication with humans in ways determined by social and cultural norms of human society.

When humans interact with each other under collaborative conditions, the social regulation of behavior helps interactions go smoothly. Much of this social protocol relies on recognizing what task other people are attempting to perform and performing own part of the protocol in turn. One of the interesting and challenging fields is to put social robots at one end of this interaction. In this type of interactions, robots get engaged in interaction with humans evoking and exchanging emotional expressions. The crucial part is to understand, perceive and respond appropriately in the context of the environment they are operating.

To demonstrate the concept, a humanoid head is developed that can interact with humans exchanging emotional expression using the facial features just like the humans do. The problem of interacting with humans exchanging emotional expression is particularly challenging since it impossible to completely model the emotional states expressed by the human and they way they should be responded to. The task becomes more complex as different person express different degrees of expression in different emotional states and expects different response in reply. Planning actions for this type of interaction involves high level of uncertainty that must be taken care of.

The primary goal of this research is to produce a practically useful computational model of this interplay for the purpose of controlling an agent in socially situated tasks. More generally, this work suggests a novel approach to modeling and planning for a particular kind of multi-agent system: one in which self-interested agents pursue their own goals in a shared environment while following some set of guidelines for behavior. In most cooperative and many adversarial domains, the goals of the other agents are known.