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Emotional Affective Models Based on Cellular Automata for Social Health Management

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Abstract— When we live in a community, from a family to a company or school, communication among people does not cease. In addition, the era of information technology does never allow us to shut off the flooding of human relations. Our mental health is ever affecting and affected by society through communication. The maintainable well-being of all people is the supreme objective in human society.

Information technology has a chance to play an essential role in achieving the total health of society. In particular, we have the motivation to observe and improve the transition of each person's mental health while keeping society lively. Good modeling of human interaction and mental health is helpful for developing such mental management system.

The mental state of a person *is affected* by the surrounding atmosphere in a micro view, while personal emotion *does affect* the environment macroscopically. We observe that the interactions between people can be represented as a function of the relationship between neighbors (*inputs*) and the person's mental state (*internal state*). In this research, we attempt to model the transition of each person's emotion and its effects on society as cellular automata.

We interpret several real-world examples and hypotheses of the effects of human communication as cellular update functions, showing the modeling ability of relatively simple cellular automata.

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