Summary

We have shown that by using ART (EFT) we have discovered a minimal neural network anatomy that can generate equivalence relation. The model incorporates determined proxy functions for PIT and TRJ. Based on MMA, the build process led to the identification of ten postulates which were sufficient for the minimal anatomy to generate equivalence relations. The property set therefore contains these postulates.

The dynamics of this particular neural network shows that if a relationship between patterns is found, then the relationship is both reflexive and symmetric. The patterns constitute a candidate set. It is further shown that if a candidate set of patterns satisfies transitivity, then that set forms elements of an equivalence class. Therefore the neural network developed here performs comparation.

The provided demonstrations shows that generation of equivalence relation by means of minimal network (Fig.5.15) is possible. For the realization of complete synthesis of objective equivalence, the overall synthesis of jugmentation is involved.

The demonstrated results are behaviors that are emergent network properties. Nothing in the design of the network explicitly inserted the relationship vs. no relationship characteristics. In other words, no a priori objective criterion for defining features was introduced. Thus, the reported experiments are the first-ever demonstration that ART is capable of self-determining feature sets.

The model therefore does not violate epistemological law of mental physics, which holds that human beings are born with no objective knowledge a priori whatsoever. The

results of this project is the first time any neural network system has demonstrated this capacity, and this is an original contribution to knowledge.

This project provides a theoretical foundation for the noetic model and hence building on this we can continue our journey in understanding “how brain-mind works” Though the current modelling scale is more towards the psychological end, the findings from such research must correspond to empirical findings from both psychological and biological studies. Thus the collaborative interdisciplinary activities play a critical role in developing such models.

Therefore this project is suitable for interests shown in computational neuroscience by funding agencies. For instance, the Collaborative Research in Computation Neuroscience (CRCNS) program by National Science Foundation (NSF).