We present a method for configuring a setup containing multi–neuron chips implementing a soft WTA for exploiting persistent activity states to process the sensory output of an event–based vision sensor in a state–dependent fashion. The resulting network accepts or refuses the trajectory of a stimulus on the basis of a previous observation. In [Neftci et al. ISCAS 2010], we give analytical groundings for these principals using the Address-Event-Representation (AER), our chips can be arbitrarily connected together to form large multi-chip networks. The setup consists in two multi-neuron chips which were stimulated by an AER asynchronous 64x64 Dynamic Vision Sensor (DVS) that responds to temporal contrast (See Below).

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Results
(Below) Raster plots of both multi-neuron chips during stimulus presentation. The red lines indicate the different phases of the stimulus, indicated by the colored arrows. The blue dots represent the input from the DVS.

Correct Stimulus
Incorrect Stimulus

Conclusion & Outlook: The recurrent AER connectivity between the two chips was set in an initial phase and gave rise to persistent activity states, that were stable even in the absence of external stimuli. The system was able to accept or reject the trajectory of the target, without precise timing of its motion or direction of movement. This illustrates state–dependent processing of an event–based visual input using a network of recurrently connected VLSI circuits implementing soft WTA.

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