1. CRFs are linear in their processing of input, with responses having additive properties, while ECRFs are nonlinear. Furthermore, CRFs have preferred stimuli and thus are sensitive to direction, orientation, and motion, and ECRFs are sensitive to none of the above and instead release inhibition dependent on contrast. In addition, CRFs are symmetric and ECRFs are asymmetric. CRFs have “approximately circular center/surround organization” (5), while ECRFs demonstrate no such “systematic spatial distribution” (6).

2. To be linear in response properties means that the response of a receptive field is proportional to its input. CRFs have linear response properties, as the firing rate is “approximately linearly determined by weighting the light in the center and surround regions” (4) of a classical receptive field. Thus, for a cell with an on-center, if light increases then firing increases (while the same might not be true of an extra-classical receptive field with nonlinear properties; if light increases but relative contrast of the stimulus remains the same ECI will be unchanged).

3. Contrast adaptation is the modulation of sensitivity according to changes in the contrast of the environment, for example, dampening neural response if there is higher global contrast. It is thought that ECRFs provide “contrast-dependent gain control on CRF sensitivity” (4). The inhibition from the ECRF might serve as gain control in the relay cells of the LGN, and as a mechanism for aperture tuning. An increase in contrast leads to a decrease in the extent of the fields of LGN and V1 cells, allowing summation to become “more spatially localized” (6).

4. Spike triggered averaging produces a mapping of the estimated stimulus that will cause a neuron to fire, through linear estimation. STA takes the mean of the “instantaneous frames present at each observed spike” (7), meaning that every time a spike is detected, that frame of the stimulus sequence is labeled, and labeled frames are averaged to form a map.

5. The dorsal pathway is thought to answer the question of “where” while the ventral pathway answers the question of “what.” The role of the dorsal stream is to mediate navigation and directed actions, and the visual stream performs shape discrimination and encodes representations of visual objects. Certain visual properties are processed within both dorsal and ventral visual pathways because the information may be behaviorally relevant to each. Binocular disparity, for example, is relevant to directing movement because it is important for depth perception and spatial representation. It is also necessary in performing object identification and discrimination because it contributes to understanding of occlusion and perceptual invariance. Thus, the same information is processed by both streams for different behavioral goals.