

Our perception of the world is an illusion: although we feel that we "see" the whole perceptual scene before us, in fact we can focus our attention on only several objects (on average, four) within that scene, while our mind virtually constructs the remainings. This can be easily demonstrated by change blindness: our prevailing inability to notice even substantial changes in the perceived scene when our attention did not focus on the changed objects. In cognitive science, the neural mechanisms responsible for the attentional, active maintenance of several selected visual objects is called visual working memory (VWM). Using a specially designed experimental paradigm, the change detection task that requires remembering colors, shapes, or orientations of from several up to 30 visual objects presented on a computer screen, the current project investigates how VWM capacity changes depending on how many, how complex, and for how long objects have to be maintained in our minds. This data as well as respective computational models can tell us how VWM works, and why we can hold in our VWM only so few items. This knowledge will help us to understand the nature of consciousness, that is, human subjective perspective towards the surrounding world. Moreover, it appears that how many objects people can maintain in VWM largely varies in population, from 1-2 objects up to 6-7 objects. This individual capacity is crucial for human cognitive capabilities: VWM capacity is positively correlated with ability to reason, use language, solve problems etc. We aim to closely investigate the nature of this relationship. Finally, we want to know whether there are any differences between men and women in how their VWM works. We hope that all of these research effort will shed new light on the workings on human mind.