CS PhD Seminar Series

July 7th | 14:30-15:00 | Room 214

Rotating Cubes by Writing Code: Measuring and Training Spatial Ability and Computational Thinking in Immersive Environments

Spatial ability and computational thinking (CT) appear to be related, yet how this relationship can be measured and leveraged in education remains an open question. This seminar explores the issue through immersive virtual reality (VR). We first adopted VR for CT education with XRCoding, a block-based programming system showing that established desktop programming interfaces can be translated into immersive environments without compromising performance. Using VR, however, makes spatial ability an intrinsic part of the interaction, raising a methodological concern: when the same spatial test is administered in VR rather than on a 2D screen, the medium itself may change what the test actually measures. A study we conducted confirmed that the medium does affect measurement, while also pointing to an association between spatial ability and CT. Building on this, we designed Cube Code, a training approach in which spatial reasoning is embedded within programming activities in three-dimensional space. Preliminary results indicate that it is feasible, well accepted by learners, and reduces the perceived difficulty of spatial tasks.

Speaker: **Lorenzo Gerini**

Lorenzo Gerini is a third-year PhD student in Computer Science at the University of Genova working at the Perception and Interaction Lab, under the supervision of professors Chessa, Solari, Guerrini and Delzanno. He works on immersive VR for computational thinking education and the assessment and training of spatial ability, studying how the immersive medium affects how these skills are measured and learned.