<CS3001-CS3606 Advanced Topics in Computer Science and Business Computing>

Topic 4: Mixed Reality 2021/2022

1) A registration error is:

   (a) An error in computing the intrinsic camera parameters.

   (b) An error in the pose estimation.

   (c) An error in rendering the virtual object in the video stream.

   (d) An error when the user interacts with the virtual elements.

   The correct answer is (b)

2) An augmentation jump is:

   (a) An artifact due to the deformation of the virtual object.

   (b) An error that occurs due to the incorrect estimation of the image distortion.

   (c) A significant change in pose between frames that causes the virtual element's augmentation to jump.

   (d) An error in detecting the marker/image with the augmented reality pipeline.

   The correct answer is (c)

3) 6 DOF (degrees of freedom) in the pose estimation refers to:

   (a) 3 axes of scaling (Sx,Sy,Sz) and 3 axes of translation (Tx,Ty,Tz).

   (b) 3 axes of translation (Tx,Ty,Tz) and 3 axes of rotations (Rx,Ry,Rz).

   (c) 3 axes of scaling (Sx,Sy,Sz) and 3 axes of rotations (Rx,Ry,Rz).

   (d) None of the above.

   The correct answer is (b)

4) The VisualSLAM technique is suitable for a scene, where the physical elements in the scene are continuously changing:

   (a) True.

   (b) False

   The correct answer is (b)

5) The calibration process within the mixed reality pipeline refers to:

(a) The estimation of the camera's optical centre and scaling.

(b) The estimation of the camera's orientation and scaling.

(c) The estimation of the camera's focal length and orientation.

(d) The estimation of the camera's orientation and translation.

The correct answer is (d)

6) The extrinsic properties of the camera are always known:

(a) True.

(b) False.

The correct answer is (b)

7) The spatial mapping process within the mixed reality pipeline is responsible for placing and moving the virtual elements of the scene.

(a) True.

(b) False.

The correct answer is (b)

8) Detecting collisions and interactions between the user's hand and the virtual objects are executed within:

(a) The optical tracking process.

(b) The localisation process.

(c) The mapping recognition process.

(d) All the above.

The correct answer is (c)

9) Voice-based interaction is one of the interaction modes within Mixed Reality.

(a) True.

(b) False.

The correct answer is (a)

10) Currently within HoloLens the collider on the user's fingertip is used to:

(a) Help with recognising the left and right hand.

(b) Help with interacting with the virtual element

(c) Establish a skeletal model for each hand.

(d) All the above.

The correct answer is (b)