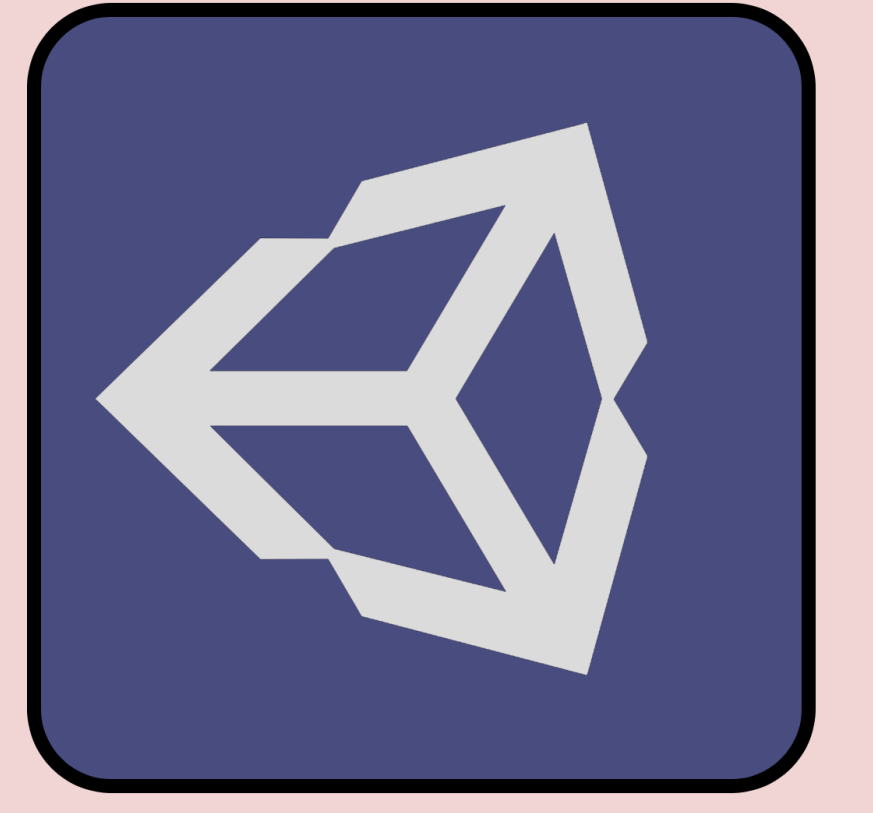




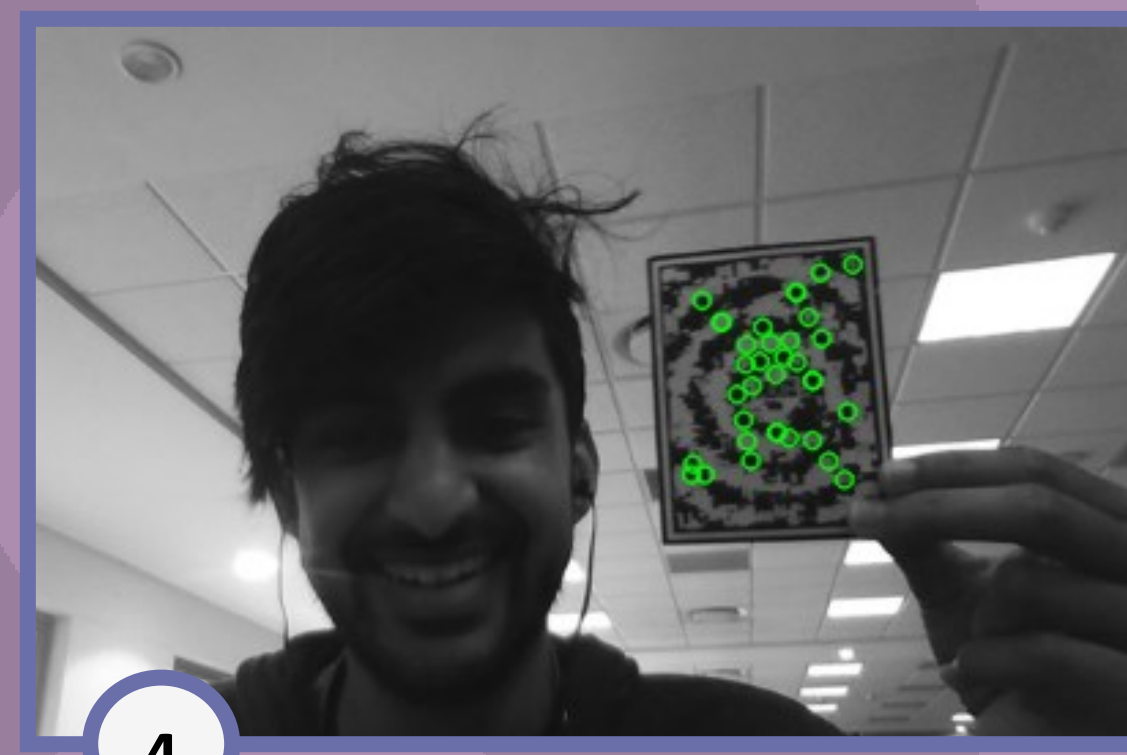
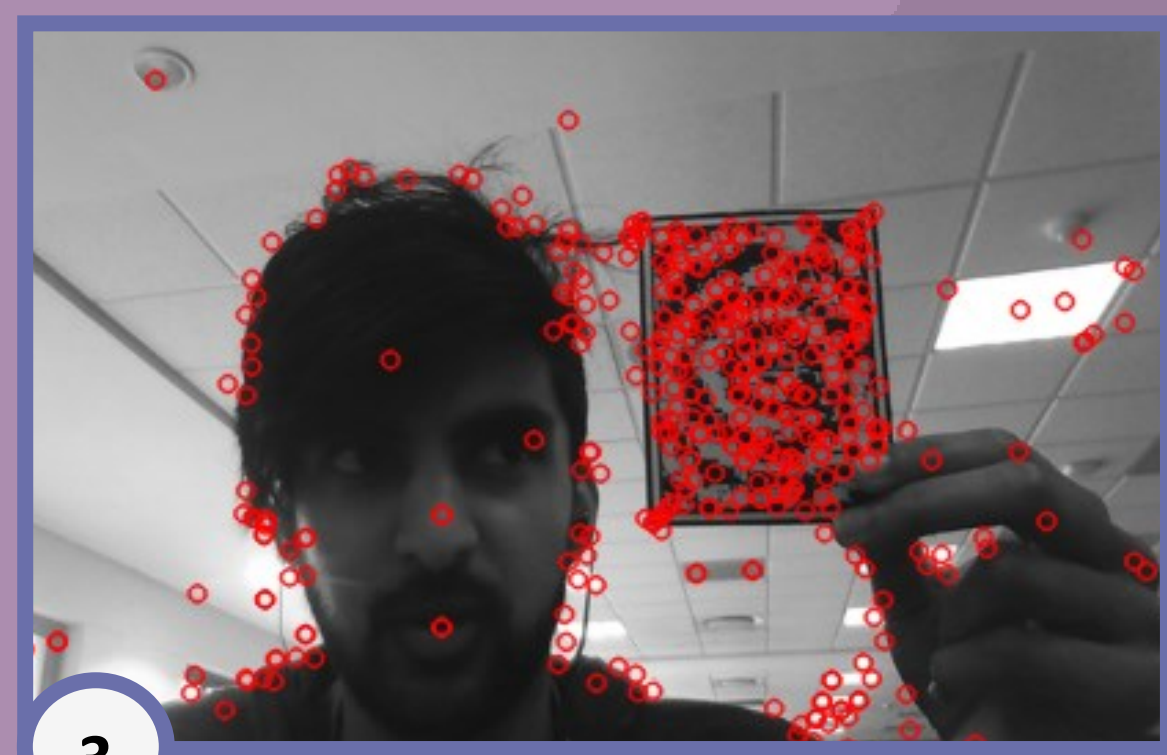
Low Cost Virtual Reality User Interface for Multi-User Educational Games



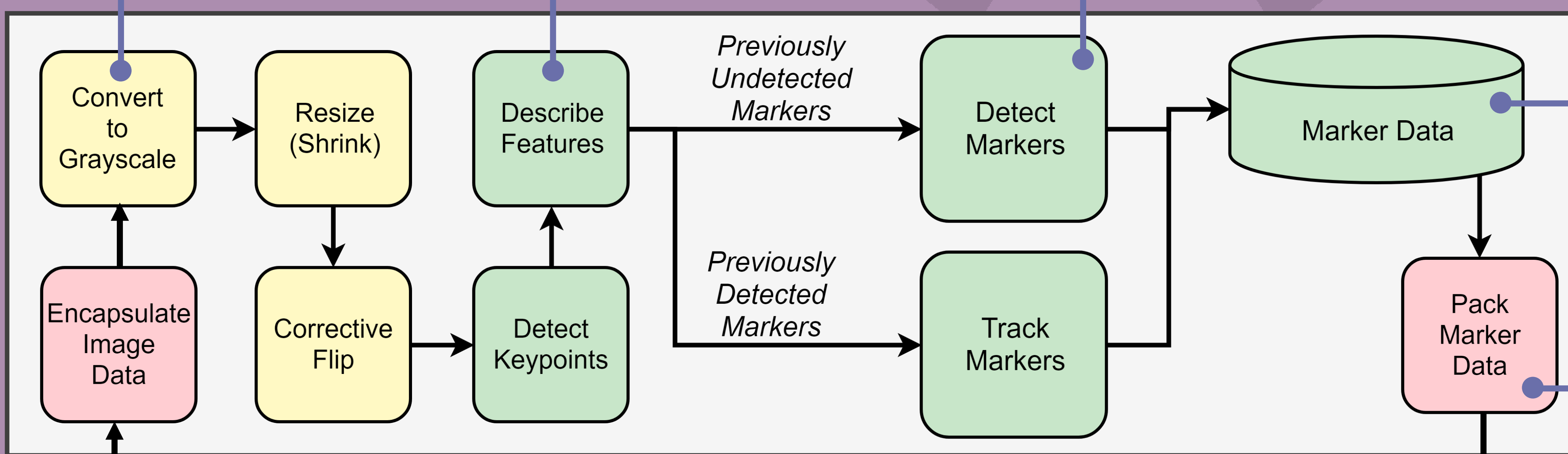
Abstract This project investigates whether a computer vision based interface is comparable to a traditional external controller (e.g. [A]) in terms of immersion, in the context of mobile virtual reality simulations. Current popular interface approaches trade monetary cost for level of interactivity. This is an issue as lower levels of interactivity reduce immersion and this would lower user engagement in educational applications that are budget-constrained. This project proposes an interface that uses the embedded smartphone's camera to track markers in the real-world. This allows users to control virtual objects, through the manipulation of real-world objects, without any additional electronics that would only add to the cost of the overall virtual reality experience.



[A]



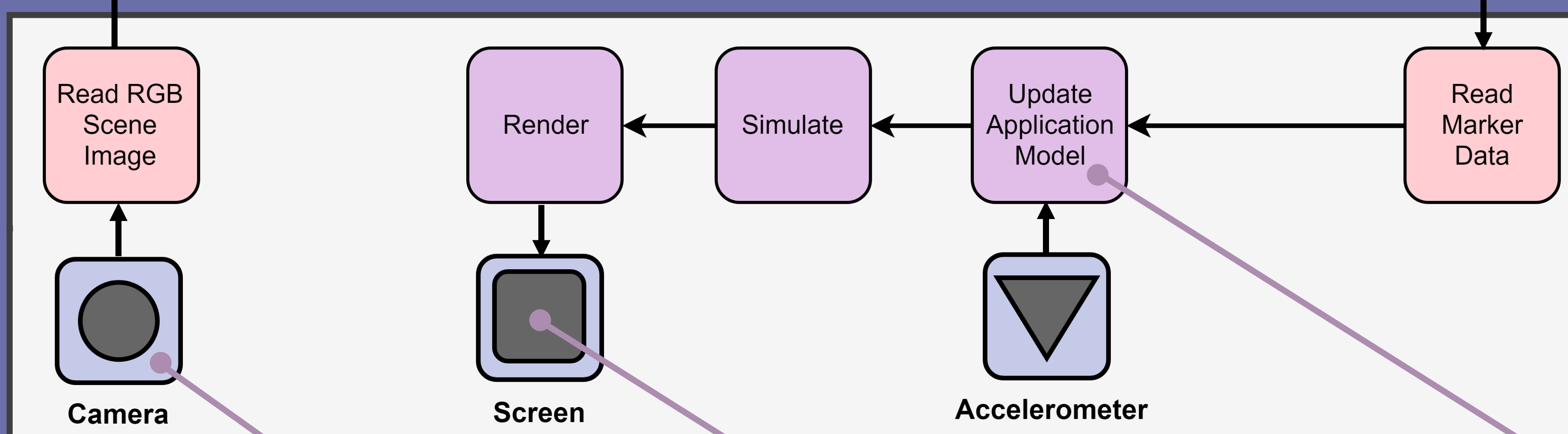
The C++ backend uses an OpenCV based detection pipeline (2-6) to localize markers in the image data (1) provided by the frontend subsystem.



Backend Computer Vision

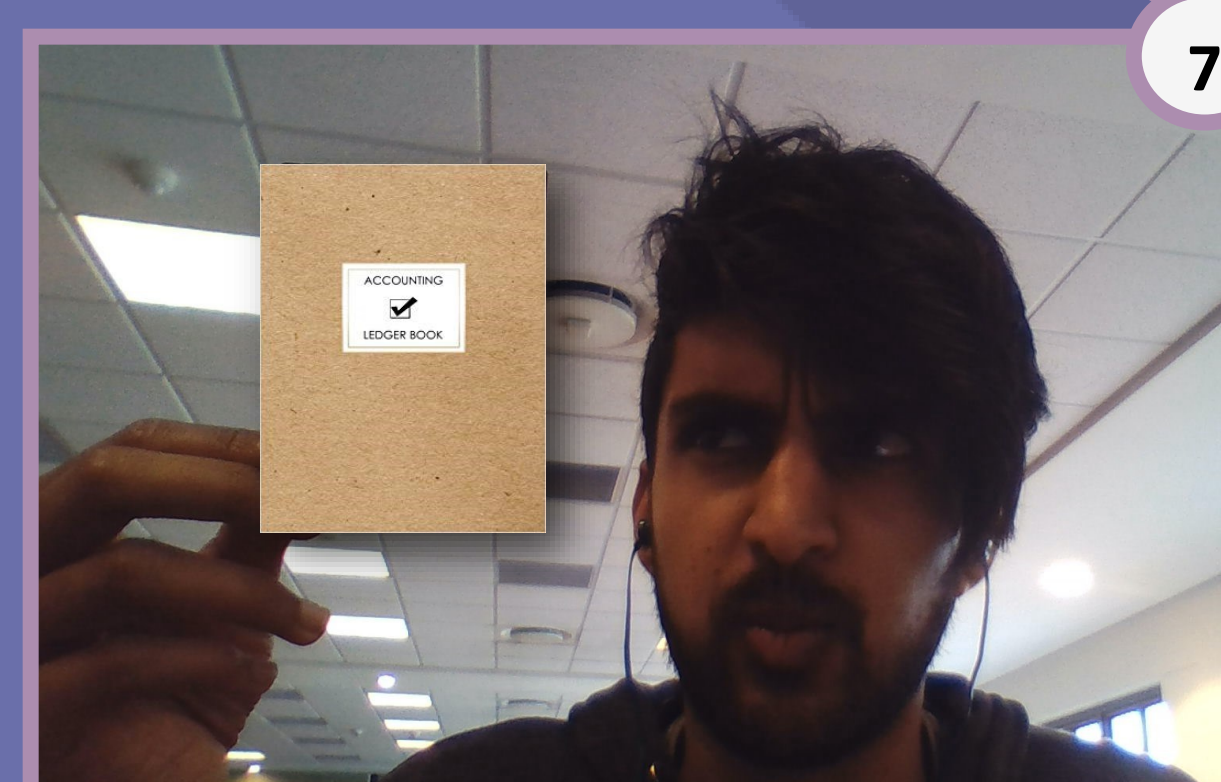
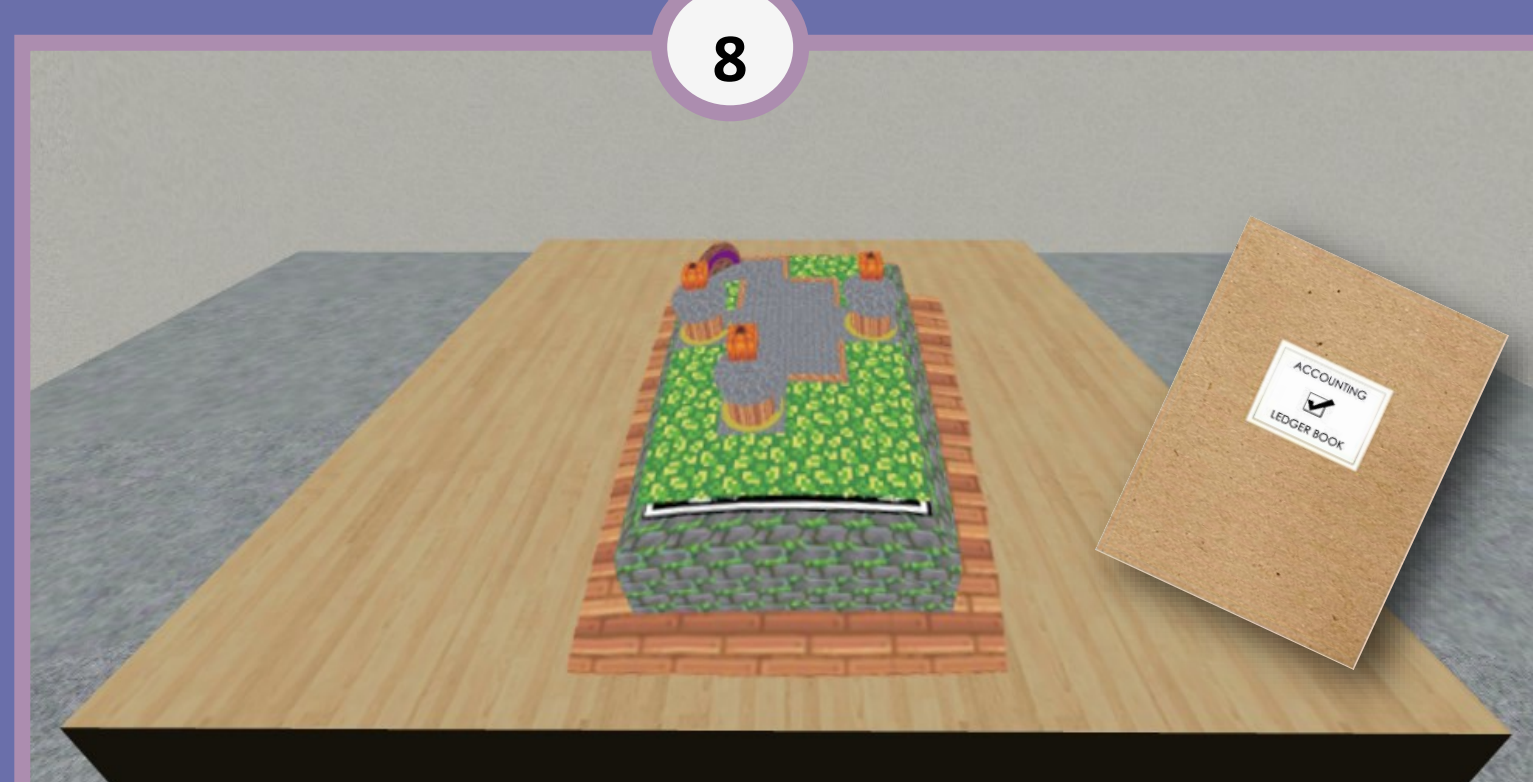


Frontend Application System



The C# frontend uses Unity and the marker information (6) from the computer vision backend to run a market simulation game (8).

In this game, players compete with one another by buying, selling and marketing oranges. The game world evolves to suit these actions.



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