Augmented Reality to Aid Construction Management

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Nowadays, before being constructed, most buildings have geometric models defined by their CAD systems. Modern CAD systems are moving from drawing programs to geometric modelers yielding and interesting new possibilities. Currently the geometric models of the building and the terrain are normally used only for design and marketing purposes.
Great benefit can be derived if cameras are installed in the construction site and a computer system can yield online images of the construction augmented with the rendering of the CAD models still not constructed. Furthermore, Photo 3D or 3D scans can be used to generate geometric models of the current constructed parts and these models can be compared with the design models. With these possibilities a computer aided construction inspection system can be built providing significant gains of productivity by mainly avoiding construction errors.
This paper presents a computer system designed to aid construction management. The system is part of a bigger effort to make Computer Aided Civil Engineering a more integrated process spanning from design to production. This paper focuses mainly in the Computer Vision challenges and the computer algorithms to meet them. The paper also discusses the implementation of a prototype system implemented in an industrial research project. Some results are also presented yielding some conclusions and suggestions of future work.