

Using Depth Mapping to realize Bokeh effect with a single camera

Android device

Pradeep Vukkadala, Ran Liu, Jie Gong
SCPD Students, Stanford University

Motivation

- Bokeh is the shallow-depth of field effect which blurs the background of portrait photos (typically) to bring emphasis of the foreground. It is usually achieved in
 - High end SLR cameras
 - Dual camera like iPhone7
 - Taking multiple images like Google Pixel Phone
- Project motivation is to achieve Bokeh using a single image from smart phone
- Core of project is depth mapping.
- More artistic enhancement of photographs can be realized using depth map, for example, foreground cartoon and background changing.

Image with and without Bokeh



Dual camera on iPhone7



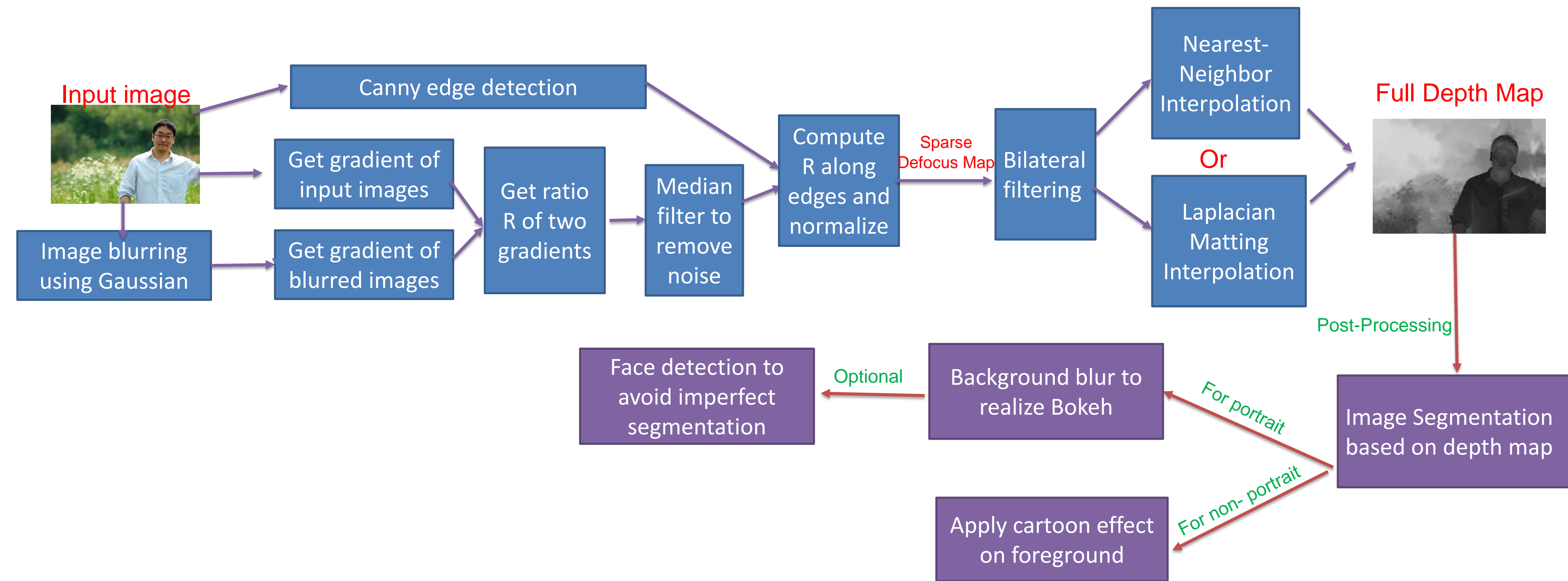
Foreground cartoon



Background changing

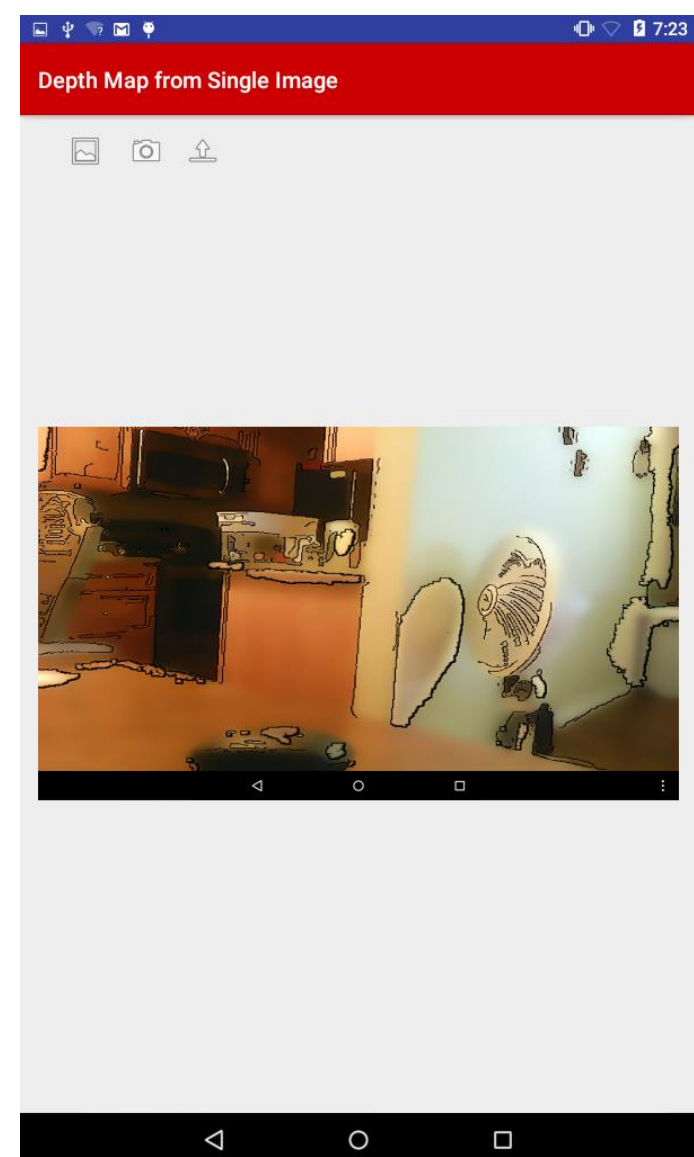


Algorithm Flowchart

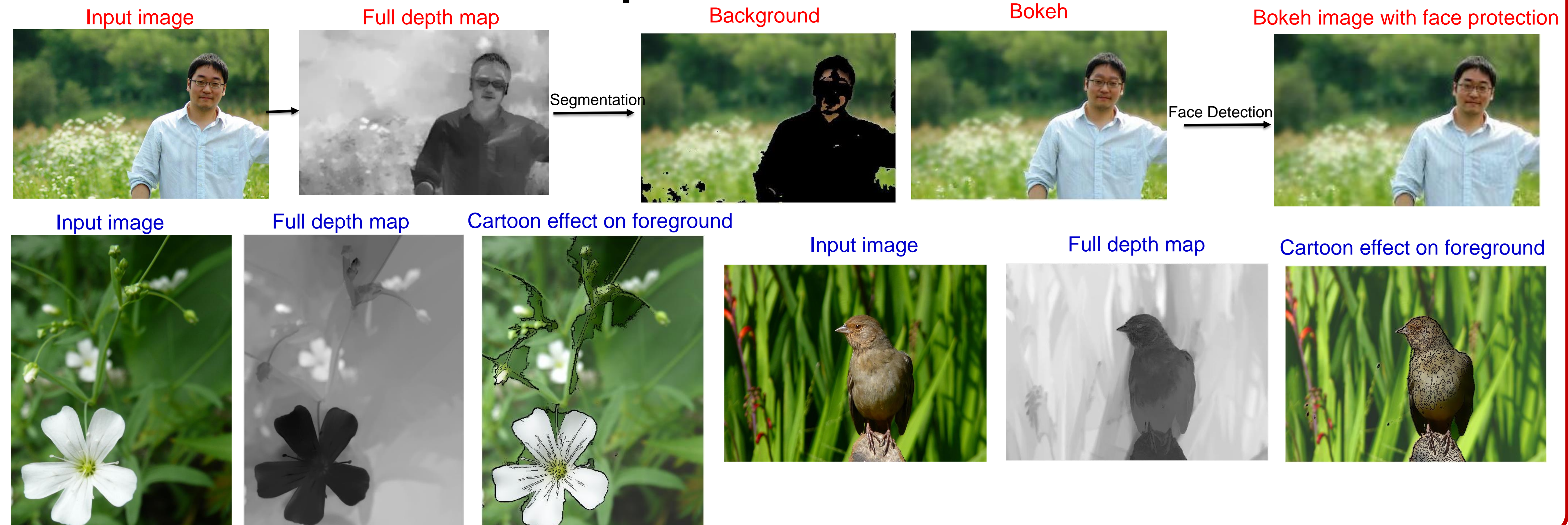


Android App

- Client and server
 - Client: Acer tablet
 - Server: Windows running Matlab
- Images can come from photos taken by Android device or from Photo Stream.



Experimental Results



Acknowledgement

- Zhuo, Shaojie, and Terence Sim. "Defocus map estimation from a single image." *Pattern Recognition* 44.9 (2011): 1852-1858.
- Levin, Anat, Dani Lischinski, and Yair Weiss. "A closed-form solution to natural image matting." *IEEE Transactions on Pattern Analysis and Machine Intelligence* 30.2 (2008): 228-242.
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