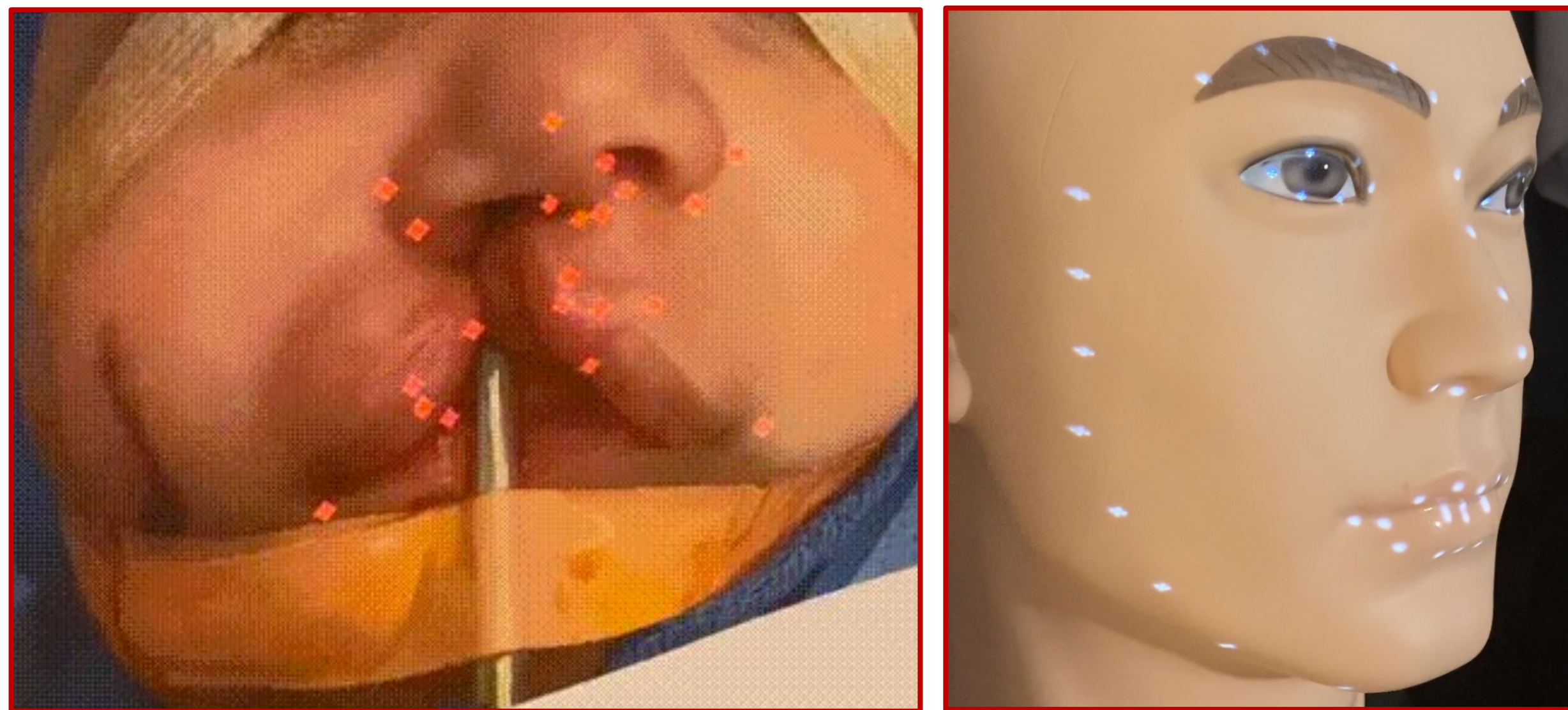


Dynamic Defocus Deblurring with Depth Data

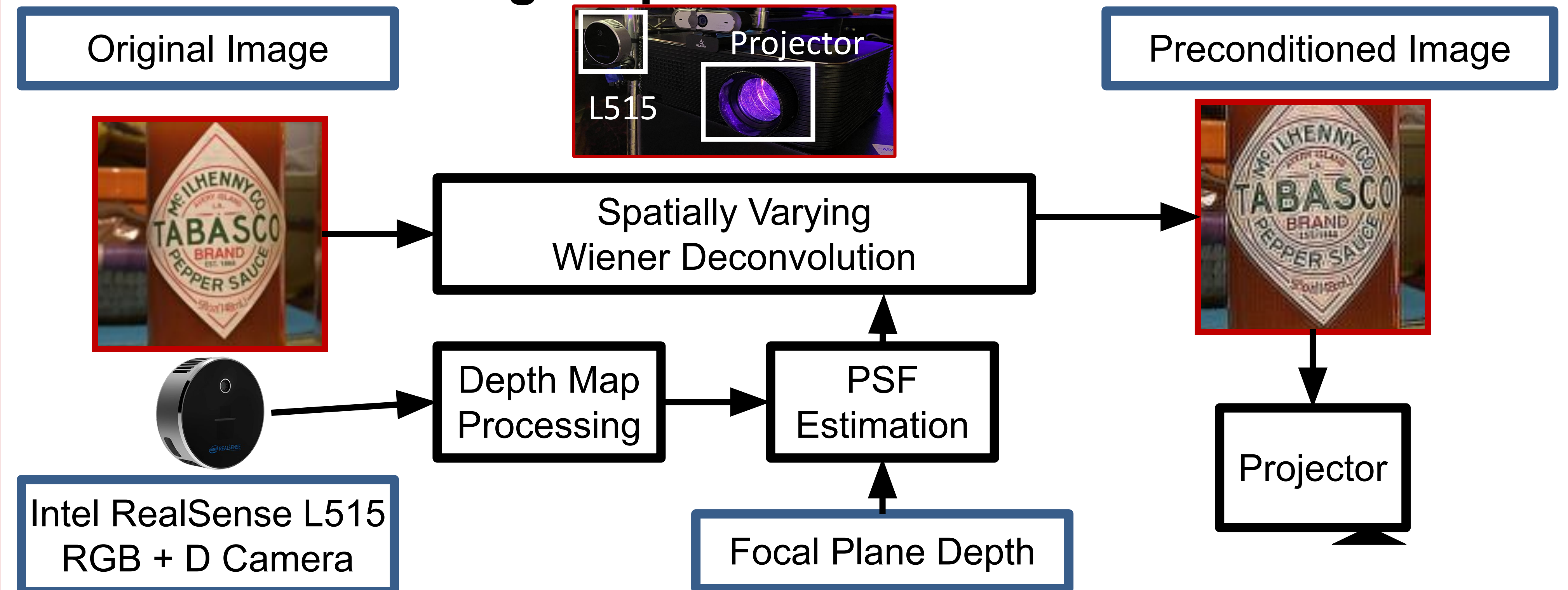
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Motivation

- Spatially augmented reality with projection mapping for surgical procedure assistance [5]
- Depth of human face -> defocus blur [4]



Real-Time Deblurring: Depth Cameras + Wiener Deconvolution



Related Work

- Zhang and Nayar 2006 [1]
Brown et al. 2006 [2]
(Static Scenes)
- ProDebNet 2020 [3]
(Deep Learning Approach, Requires Training)



Experimental Results

- + 1 dB PSNR Theoretical Increase
- ~ 5 FPS (Intel i7 10750H, RTX 2070 Max Q)



References

- [1] Zhang and Nayar. "Projection defocus analysis for scene capture and image display". *ACM Trans. Graph.* 2006.
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- [3] Kageyama et al. "ProDebNet: projector deblurring using a convolutional neural network". *Opt. Express* 2020.
- [4] Bimber et al. "The visual computing of projector-camera systems". *SIGGRAPH* 2008.
- [5] Vyas et al. "Using Virtual Augmented Reality to Remotely Proctor Overseas Surgical Outreach: Building Long-Term International Capacity and Sustainability". *Plast Reconstr Surg.* 2020.