

Jongmin Baek (Ph. D.)

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INTERESTS Computational photography, image filtering, low- and medium-level computer vision, signal processing, computational optics, machine learning, compression, performance optimization.

Informally speaking, I make bits do interesting things, and do so very efficiently at algorithmic and architectural levels. Recently I have worked on more high-level machine learning tasks.

I also try to find opportunities to do impactful work outside my core expertise.

CURRENT **Dropbox, Inc. (Current)**, San Francisco, CA USA

EMPLOYMENT *Machine Learning Engineer* **2014–**

- Developed novel computer vision and machine learning algorithms, optimized and integrated them into production across backend and mobile platforms; owned key algorithms in the document scanner, OCR pipeline, and other ML-powered features.
- Authored several [technical blog posts](#) and patents related to the said algorithms.
- Authored the image processing stack at Dropbox, which processes orders of petabytes of data daily and powers the preview pipeline.
- Worked on and open-sourced a few libraries for [image processing](#) and [compression](#).
- Served as one of the dozen or so senior members of the engineering organization that moderated hiring debriefs for engineers.
- Won or was nominated for award at company Hack Week for each of the past five years.

EDUCATION **Stanford University**, Stanford, CA USA

Ph.D. in [Computer Science](#) (2008 – 2013) under Prof. [Marc Levoy](#).

- Thesis title: *WYSIWYG Computational Photography via Viewfinder Editing*

M.S. in [Computer Science](#) (2008 – 2011; GPA 4.3/4.0)

Massachusetts Institute of Technology, Cambridge, MA USA

M.Eng. in [Electrical Engineering and Computer Science](#) (2008) under Prof. [Frédo Durand](#).

- Thesis title: *Multi-channel Coded-aperture Photography*

B.S. in [Computer Science and Engineering](#) (2004 – 2008; GPA 5.0/5.0)

B.S. in [Mathematics \(Theory\)](#) (2004 – 2008; GPA 5.0/5.0)

PUBLICATIONS Baek, J., Pająk, D., Kim, K., Pulli, K. and Levoy, M. [WYSIWYG Computational Photography via Viewfinder Editing](#). *ACM SIGGRAPH Asia*. 2013.

Baek, J., Adams, A. B. and Dolson, J. Lattice-based High-Dimensional Gaussian Filtering and the Permutohedral Lattice. *Journal of Mathematical Imaging and Vision*. 2013.

Baek, J., Jacobs, D. E. and Levoy, M. [Accelerating Spatially Varying Gaussian Filters](#). *ACM SIGGRAPH Asia*. 2010.

Adams, A. B., Talvala, E., Park, S. H., Jacobs, D. E., Ajdin, B., Gelfand, N., Dolson, J., Vaquero, D., Baek, J., Tico, M., Lensch, H. P. A., Matusik, W., Pulli, K., Horowitz, M. and Levoy, M. [The Frankencamera: an Experimental Platform for Computational Photography](#). *ACM SIGGRAPH*. 2010.

Dolson, J., Baek, J., Plagemann, C. and Thrun, S. [Upsampling Range Data in Dynamic Environments](#). *IEEE Computer Vision and Pattern Recognition*. 2010.

Baek, J. [Transfer Efficiency and Depth Invariance in Computational Cameras](#). *IEEE International Conference in Computational Photography*. 2010.

Adams, A. B., Baek, J. and Davis, M. A. [Fast High-Dimensional Filtering using the Permutohedral Lattice](#). *Eurographics*. 2010.

REPORTS Jacobs, D. E., Baek, J. and Levoy, M. [Focal Stack Compositing for Depth of Field Control](#). Tech. report CSTR-2012-01, Stanford.

Karpenko, A., Jacobs, D. E., Baek, J. and Levoy, M. [Digital Video Stabilization and Rolling Shutter Correction using Gyroscopes](#). Tech. report CSTR 2011-03, Stanford.

INVITED TALKS WYSIWYG Computational Photography via Viewfinder Editing. *GPU Technology Conference*. Santa Clara, CA USA, 2014.

PATENTS U.S. Patents 9,407,814; 9,799,106; 9,941,900; a few more pending.

RECENT EMPLOYMENT [NVIDIA Research](#), Santa Clara, CA USA

Mobile Visual Computing (MVC) Group **Summer 2012, 2013**

- Worked with the Mobile Visual Computing group and led the development of algorithms and interfaces for editing on a live viewfinder of a mobile camera. See above sections on education and publications. (C++, GLSL, Assembly, Matlab)

[Department of Computer Science, Stanford University](#), Stanford, CA USA

Teaching Fellow **Winter 2011**

- Taught [CS478](#), a graduate course in computational photography; was responsible for lectures, assignments, and development environment; advised students on final projects.

[Google, Inc.](#), Mountain View, CA USA

Site Reliability Engineering **Summer 2010**

- Analyzed the search indexing pipeline to identify latencies in various stages, processing large datasets with map-reduce pattern. (C++)

RECOGNITIONS • Recipient of Lucent Technology Fellowship (Stanford Graduate Fellowship), 2010.

• Grand prize, [CS348B Rendering Competition](#) (joint work with David E. Jacobs and Myers A. Davis). Featured in [Physically Based Rendering](#), 2nd ed.

• Finalist, [CS248 Video Game Competition](#).

• National Science Foundation Graduate Research Fellowship: Honorable Mention (2009)

• William Lowell Putnam Mathematical Competition: Honorable Mention (2005)

• USA Mathematical Olympiad: Winner (2004), Honorable Mention (2002, 2003)