

## Hands-on CV/ML tech leader and applied scientist

### Education

- 2010–2015 **PhD, Computer Science**, *Cornell University*, Ithaca, NY, USA.  
Thesis Title: Computational lighting design and image filtering for material enhancement
- 2014 **MS, Computer Science**, *Cornell University*, Ithaca, NY, USA, GPA: 4.00.  
Selected Courses: Special Topics in Computer Vision, Computational Photography, Data-Sparse Matrix Computations, Probabilistic Graphical Models, Machine Learning, Applications of Parallel Computers
- 2005–2009 : **BS, Computer Science**, *Sofia University*, Sofia, Bulgaria.  
First in the class of Computer Science major 2009, GPA: 6.00 out of 6.00

### Work Experience

#### Zillow Group, Seattle, WA, USA

- Feb,2019 – present **Senior Manager, Applied Science.**  
Leading a cross-functional team of Applied Scientists and Machine Learning Engineers working on indoor scene understanding, reconstruction, and modeling. Working cross-team boundaries, I managed a team that delivered a high-degree of automation for our proprietary floor-plan reconstruction pipeline. Mentoring and growing people's career plans and setting research agendas, from junior through principal level. Pushed state-of-the-art performance to achieve business goals, published at top-tier scientific venues. Led the release of a public-facing Zillow Indoor Dataset, to include and empower the broader ML community, published in CVPR 2021.
- Feb,2017 – **Principal Applied Scientist.**  
Feb,2019 Design and implementation of PanoLib (python): an internal library to handle a variety of 360 panorama utilities, e.g. from low-level math fundamentals, like spherical projections and perspective sampling, through high-level features, like 360 up-right camera correction, to applications like 360 two-shots person removal.
- Aug,2015 – **Senior Engineer, 3D Reconstruction.**  
Feb,2017 Worked on various core computer vision tech (C++): (1) parallax-tolerant panorama stitching for Zillow 3D Home (2) intrinsic image decomposition for Zillow Digs (3) video stabilization for Zillow Video Walkthrough.

#### Adobe Research, Cambridge, MA, USA

- May,2014 – **Research Intern, Computer Vision.**  
Aug,2014 Worked on a prototype system for DIY lighting-design for product videography (published in ICCP'16)
- May,2013 – **Research Intern, Computer Vision.**  
Aug,2013 Studied the effect of multi-scale image analysis on altering material perception (published in ACM TOG'15)
- May,2012 – **Research Intern, Computer Vision.**  
Aug,2012 Developed a system for DIY image compositing for photographic lighting (published in SIGGRAPH'13)

#### Everbread Limited (Airfare Startup), Sofia, Bulgaria

- Jan,2010 – **Software Engineer, Backend.**  
Sep,2010 Worked on a C++ client/server application to collect and broadcast availability of flights

#### CERN, European Organization for Nuclear Research, Geneva, Switzerland

- Jun,2009 – **Software Engineer Intern.**  
Sep,2009 Worked on the project Geant4, a toolkit for the simulation of the passage of particles through matter. Investigated the CSG geometry module; analyzed correctness, measured and helped improve its performance

#### NVIDIA Corporation, Santa Clara, CA, USA

- Jun,2008 – **Software Engineer Intern, Linux Drivers.**  
Sep,2008 Implemented memory management module between OpenGL and X drivers. Worked on the 10 bits per component mode (30-bit color mode).
- Jun,2007 – **Software Engineer Intern, Linux Drivers.**  
Sep,2007 Implemented GPU driver acceleration for the computation of XVideo hue and saturation values. Optimization of various XRandR operations for the Linux driver.

## Publications

- 2022 Tiancheng Zhi, Bowei Chen, **Ivaylo Boyadzhiev**, Sing Bing Kang, Martial Hebert, and Srinivasa G Narasimhan. Semantically supervised appearance decomposition for virtual staging from a single panorama. *ACM ToG (SIGGRAPH)*, 2022.
- 2022 Yu Yin, Will Hutchcroft, Naji Khosravan, **Ivaylo Boyadzhiev**, Yun Fu, and Sing Bing Kang. Generating topological structure of floorplans from room attributes. In *ICMR*, 2022.
- 2022 Haiyan Wang, Will Hutchcroft, Yuguang Li, Zhiqiang Wan, **Ivaylo Boyadzhiev**, Yingli Tian, and Sing Bing Kang. Psmnet: Position-aware stereo merging network for room layout estimation. In *CVPR*, 2022.
- 2022 Zhixiang Min, Naji Khosravan, Zachary Bessinger, Manjunath Narayana, Sing Bing Kang, Enrique Dunn, and **Ivaylo Boyadzhiev**. Laser: Latent space rendering for 2d visual localization. In *CVPR*, 2022.
- 2022 John Lambert, Yuguang Li, **Ivaylo Boyadzhiev**, Lambert Wixson, Manjunath Narayana, Will Hutchcroft, James Hays, Frank Dellaert, and Sing Bing Kang. Salve: Semantic alignment verification for floorplan reconstruction from sparse panoramas. In *ECCV*, 2022.
- 2022 Will Hutchcroft, Yuguang Li, **Ivaylo Boyadzhiev**, Zhiqiang Wan, Haiyan Wang, and Sing Bing Kang. Covispose: Co-visibility pose transformer for wide-baseline relative pose estimation in 360° indoor panoramas. In *ECCV*, 2022.
- 2021 Steve Cruz, Will Hutchcroft, Yuguang Li, Naji Khosravan, **Ivaylo Boyadzhiev**, and Sing Bing Kang. Zillow indoor dataset: Annotated floor plans with 360° panoramas and 3d room layouts. In *CVPR*, 2021.
- 2016 **Ivaylo Boyadzhiev**, Jiawen Chen, Sylvain Paris, and Kavita Bala. Do-it-yourself lighting design for product videography. In *ICCP*, 2016.
- 2016 Satoshi Ikehata, **Ivaylo Boyadzhiev**, Qi Shan, and Yasutaka Furukawa. Panoramic structure from motion via geometric relationship detection. *arXiv preprint arXiv:1612.01256*, 2016.
- 2015 **Ivaylo Boyadzhiev**, Kavita Bala, Sylvain Paris, and Edward Adelson. Band-sifting decomposition for image-based material editing. *ACM ToG*, 2015.
- 2013 **Ivaylo Boyadzhiev**, Sylvain Paris, and Kavita Bala. User-assisted image compositing for photographic lighting. *SIGGRAPH*, 2013.
- 2012 **Ivaylo Boyadzhiev**, Kavita Bala, Sylvain Paris, and Frédo Durand. User-guided white balance for mixed lighting conditions. *SIGGRAPH Asia*, 2012.

## Patents

Zillow Group 15+ patents around indoor capture, reconstruction, visualization and exploration: check Google Scholar

## Services

CVPR **2020-2022**.

ECCV/ICCV **2021, 2022**, *Outstanding Reviewer Award*.

SIGGRAPH **2015-2018, 2022**.

## Technologies

Languages Python, C/C++, JAVA, Matlab, Bash, Ruby

Frameworks OpenCV, OpenGL, PyTorch, Keras

## Teaching Assistantship

Spring, 2013 : **Advanced Interactive Graphics**, *Cornell University*.

Fall, 2011 : **Introduction to Computer Graphics**, *Cornell University*.

Spring, 2011 : **Scientific Computation**, *Cornell University*.

Fall, 2010 : **Introduction to Computer Graphics**, *Cornell University*.

2007, 2008 : **Design and Analysis of Computer Algorithms**, *Sofia University*.