

# INCHANG CHOI (최인창)

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**KAIST** (Korea Advanced Institute of Science and Technology)

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My research interests include **image processing**, **computer vision**, and **computer graphics**. I have participated in many research project of **computational photography**, where **optimization** frameworks were incorporated to enhance image/video quality and to extract additional information, such as **alpha mattes**, **high dynamic range**, **hyperspectra**, and **depth**. In particular, I have numerous experiences of exploiting **machine learning** to learn sparse/nonlinear **representation** from data, and to use them to improve the quality of the data. Recently, I am very attracted to deep neural networks and deep generative models. Since February 2018, I have been doing internship in LPR (Learning and Perception Research) group of **NVIDIA Research** in Santa Clara.

## EDUCATION

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03/2012–Present **PhD Student at KAIST**

– Studying in **VCLAB** (Visual Computing Lab.) with Prof. Min H. Kim

03/2010–02/2012 **M.S in Computer Science at KAIST**

– Studied in **CVIP** Lab. and advised by Prof. Yu-Wing Tai

– Thesis: Video Matting using Multi-Frame Nonlocal Matting Laplacian

03/2005–02/2010 **B.S in Computer Science at KAIST**

09/2008–08/2009 Exchange student program in Technische Universität München (**TUM**)

05/2006–08/2006 Summer session program in **UCSD**

## AWARDS/FELLOWSHIPS

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- **NAVER PhD Fellowship**

- Received NAVER PhD Fellowship award in 2017. NAVER is one of the most influential IT company in Korea.

## PUBLICATIONS

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### International SCI(E) Journals:

[J1] **Inchang Choi**, Daniel S. Jeon, Giljoo Nam, Diego Gutierrez, Min H. Kim (2017), “High-Quality Hyperspectral Reconstruction Using a Spectral Prior,” *ACM Transaction on Graphics (ACM TOG)*, Nov. 2017, to be presented at **SIGGRAPH Asia 2017**, Nov. 27, 2017 (**SCI-IF=4.218**)

- Proposed an novel optimization framework for hyperspectral image reconstruction.
- A *convolutional autoencoder* participates in the optimization framework as a hyperspectral prior.

[J2] **Inchang Choi**, Seung-Hwan Baek, Min H. Kim (2017), “Reconstructing Interlaced High-Dynamic-Range Video using Joint Learning,” *IEEE Transaction on Image Processing (IEEE TIP)*, to appear, 2017, (**SCI-IF=4.828**)

- Proposed to reconstruct HDR video from gain-interlaced sensor read-outs.
- Used *joint sparse coding* to learn sparse representation of interlaced images.

- [J3] Daniel S. Jeon, **Inchang Choi**, Min H. Kim (2016), “Multisampling Compressive Video Spectroscopy” Computer Graphics Forum (**CGF**), presented at **EUROGRAPHICS 2016**, May 12, 2016 (**SCIE-IF=1.542**)

#### **International Conference Proceedings:**

- [C1] Daniel S. Jeon, Seung-Hwan Baek, **Inchang Choi**, Min H. Kim (2018), “Enhancing the Spatial Resolution of Stereo Images using a Parallax Prior,” Proc. IEEE Computer Vision and Pattern Recognition (**IEEE CVPR**) 2018
- [C2] Seung-Hwan Baek, **Inchang Choi**, Min H. Kim (2016), “Multiview Image Completion with Space Structure Propagation,” Proc. IEEE Computer Vision and Pattern Recognition (**IEEE CVPR**) 2016
- [C3] Joo Ho Lee, **Inchang Choi**, Min H. Kim (2016), “Laplacian Patch-Based Image Synthesis,” Proc. IEEE Computer Vision and Pattern Recognition (**IEEE CVPR**) 2016
- [C4] **Inchang Choi**, Sunyeong Kim, Michael S. Brown, Yu-Wing Tai (2013), “A Learning-Based Approach to Reduce JPEG Artifacts in Image Matting,” Proc. IEEE International Conference on Computer Vision (**IEEE ICCV**) 2013
- Removed blocky JPEG artifacts that are problematic in alpha mattes.
  - Used *joint sparse coding* to learn sparse representation of high quality alpha mattes.
- [C5] **Inchang Choi**, Minhaeng Lee, Yu-Wing Tai (2012), “Video Matting Using Multi-Frame Nonlocal Matting Laplacian,” Proc. European Conference on Computer Vision (**ECCV**) 2012
- Proposed nonlocal matting Laplacian for video matting.
  - Generates temporally coherent alpha mattes for natural video composition.

## **PROJECTS**

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- [1] 3D 360 camera system and algorithm (2017–Present), Center for Integrated Smart Sensor (**CISS**)
- [2] Developing a 4D scanning system (2017), Electronics and Telecommunications Research Institute (**ETRI**)
- [3] Developing applications for mobile software platform (2015–2016), **KAIST Center for Mobile Software Platform**
- [4] A research project on a CMOS image sensor (2014–2015), **SK Hynix**
- [5] A research project on digital 3D imaging (2013–2014), **Samsung Electronics**
- [6] Video enhancement and editing using inputs from Xbox Kinect (2011–2012), **Microsoft Research Asia**
- [7] Automatic high quality 3D video transformation for 2D Video, (2010–2013), Korea Creative Content Agency (**KOCCA**)

## **SKILLS**

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### **Languages**

- Native Korean
- Proficient English, basic German

### **Programming**

- C/C++, Java, Matlab, Python
- OpenCV, OpenGL, PCL (Point Cloud Library)
- CUDA, Caffe, Tensorflow, PyTorch

## REFERENCES

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**Prof. Min H. Kim**

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