



# CHRIS HENRY

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## PROFESSIONAL SUMMARY

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- *Field of expertise* **Image processing, computer vision, and deep learning**
- *Research experience* 9 research articles (3 articles in **SCIE journals**)
- *Software skills* **C++, Python**, and MATLAB  
**Tensorflow, Keras, OpenCV**, Pillow, NumPy, SciPy, and Matplotlib  
**PyCharm**, Visual Studio, and Jupyter Notebook
- *Hardware skills* **Embedded systems** like Raspberry Pi
- *Foreign language skill* English (**TOEFL 105/120**)

## EDUCATION

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**Master of Engineering IT Convergence Engineering** **2017-2019**

Gachon University, South Korea

*Grade:* 4.44/4.5 (President's Award for Academic Excellence)

*Advisor:* Prof. Sang-Woong Lee

**Bachelor of Engineering in Electronic Engineering** **2011-2015**

Hamdard University, Pakistan

*Grade:* 3.14/4

## SELECTED PUBLICATIONS

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- **C. Henry**, S.-Y. Ahn, and S.-W. Lee, "Multinational License Plate Recognition Using Generalized Character Sequence Detection," **IEEE Access**, Vol. 8, February **2020**. pp. 35185-35199. (**IF: 4.098/Rank: 14.5%/Q1**)
- **C. Henry** and S.-W. Lee, "Automatic Trimap Generation and Artifact Reduction in Alpha Matte using Unknown Region Detection," **Expert Systems with Applications**, Vol. 133, November **2019**, pp. 242-259. (**IF: 4.292/Rank: 8.9%/Q1**)

## PROJECTS

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**Master's Projects** **Multinational License Plate Recognition (LPR)**

- *Implementation details:* Python, Darknet, and OpenCV.
- Developed a deep learning-based LPR system applicable to multinational license plates.
- The system worked in real-time consuming about 42 ms per image on average.
- The proposed system was evaluated on LP datasets from five countries which include South Korea, Taiwan, Greece, USA, and Croatia and outperformed academic and commercial software.

**Automatic Trimap Generation & Artifact Reduction**

- *Implementation details:* MATLAB.
- Designed and implemented a fully automatic trimap generation algorithm for image matting.
- The system was based on image saliency, graph cut segmentation, and fuzzy c-means clustering.
- The algorithm does not rely on depth data and produces a better segmentation.

**Allergic Rhinitis Prediction based on Artificial Intelligence (AI)**

- *Implementation details:* Python, Tensorflow, and Keras.
- A system based on AI was developed to predict the likelihood of allergic rhinitis.
- The system can learn from weather and user data for a personalized prediction.
- ANN and RNN were used for general and personalized user prediction, respectively.

**Bachelor's Project** **Vision-based Marine Rover for Pipeline Monitoring**

- *Implementation details:* Python and OpenCV.
- An Autonomous Underwater Vehicle (prototype) was designed for fault detection in underwater gas/oil pipeline using image processing techniques.
- Raspberry Pi was used for image processing and as a control device. The system was tested in a water reservoir.

**Other Projects** **Vision-based Computer Mouse Control**

- *Implementation details:* Python, OpenCV, and Dlib.
- This project can control a computer's mouse via user's pupil movement and eye blinking/winking.
- Users can move the mouse cursor via their pupil movements and can also click left and right mouse button via eye winks.

### Bike Fit Calculator

- *Implementation details:* Python, and OpenCV.
- This project aims at improving the performance and efficiency of cyclists and preventing injuries.
- The developed system calculates the optimal saddle height for cyclists to avoid knee injuries.
- The system tracks markers on the cyclists and calculates the optimal saddle height by using various angle measurements.

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## PROFESSIONAL EXPERIENCE

### Graduate Research Assistant

Feb 2017 – Sept 2019

Pattern Recognition and Machine Learning Laboratory, Gachon University, South Korea

#### Responsibilities

- Design and implement various image processing/computer vision/deep learning systems.
- Conduct research on multiple research/company projects.
- Write research articles in international/domestic journals and conferences.
- Assist my advisor in writing research proposals, peer-reviewing publications, etc.

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## ALL PUBLICATIONS

### International Journals

- **C. Henry**, S. Poudel, S.-W. Lee, and H. Jeong, "Automatic Detection System of Deteriorated PV Modules Using Drone with Thermal Camera," Applied Sciences, Vol. 10, No. 11: 3802. **(IF: 2.217/Rank: 45.9%/Q2)**
- **C. Henry**, S.-Y. Ahn, and S.-W. Lee, "Multinational License Plate Recognition Using Generalized Character Sequence Detection," IEEE Access, Vol. 8, February 2020. pp. 35185-35199. **(IF: 4.098/Rank: 14.5%/Q1)**
- **C. Henry** and S.-W. Lee, "Automatic Trimap Generation and Artifact Reduction in Alpha Matte using Unknown Region Detection," Expert Systems with Applications, Vol. 133, November 2019, pp. 242-259. **(IF: 4.292/Rank: 8.9%/Q1)**

### International Conferences

- **C. Henry** and S.-W. Lee, "Real-time Deep ALPR for Korean License Plates using YOLO Object Detector," Proceedings of The International Conference on Next Generation Computing, Vung Tau, Vietnam, December 2018, pp. 251-253. (Poster Presentation)
- **C. Henry** and S.-W. Lee, "Visual Saliency based Automatic Trimap Generation," Proceedings of The International Conference on Next Generation Computing, Kaohsiung, Taiwan, December 2017, pp. 113-116. (Oral Presentation)
- **C. Henry**, H.-C. Park, and S.-W. Lee, "A Review on the Segmentation of Embossed/raised Text," Proceedings of The International Conference on Next Generation Computing, Ho Chi Minh, Vietnam, January 2017, pp. 165-167. (Poster Presentation)

### Domestic Journal

- A. Tedjokusumo, H.-C. Park, **C. Henry**, and S.-W. Lee, "Invariant Color Features Detector and Descriptor using Fast Explicit Diffusion in Nonlinear Scale Spaces," Journal of the Korea Institute of Next Generation Computing, Vol. 19, No. 1, February 2019, pp. 15-27.

### Domestic Conferences

- **C. Henry**, H.-C. Park, S.-W. Kim, and S.-W. Lee, "Photovoltaic Module Detection using Probabilistic Hough Transform," Proc. of 2018 KING Summer Conference, Jeju, Korea, May 2018, pp. 286-289. (Poster Presentation)
- **C. Henry** and S.-W. Lee, "A Survey on Automatic Natural Image Matting algorithms," Proc. of KCC2017, Jeju, Korea, June 2017, pp. 1372-1374. (Poster Presentation)

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## SELF-EMPLOYMENT EXPERIENCE

### Freelancer (Computer Vision Developer and IT Support Services)

2016 – Present

Fiverr

#### Responsibilities

- Develop image processing/computer vision/deep learning solutions.
- Provide remote support for computer related issues.
- Process online orders from customers worldwide and establish/maintain a lasting relationship with customers globally.

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## INTERNSHIPS

Pakistan International Airlines, Karachi, Pakistan

7-21 Jul 2014

Lotte Chemical Pakistan Ltd., Karachi, Pakistan

Feb 2014 - Mar 2014

Institute of Industrial Electronics Engineering, Karachi, Pakistan

Aug 2013 - Sep 2013

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## HONORS/ACHIEVEMENTS

- Recipient of "President's Award for Academic Excellence" from Gachon University. **2019**
- Received scholarship for master's degree from Gachon University (100% tuition fee waiver + stipend). **2017-2019**

- Undergraduate final year project received a funding from the Ministry of Information Technology, Government of Pakistan under National Grassroots ICT Research Initiative Program 2014-15. **2015**
- Certificate of Appreciation for excellent grades in 7th semester (undergraduate). **2015**

### **EXTRACURRICULAR ACTIVITIES**

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- Volunteer at Hamdard University Convocation 2014.
- Participant at Hamdard University Media Accession & Reinforcement Convention 2013, Hamdard University, Karachi.
- Lead Actor in "Life of St. Paul" drama at St. Paul's English High School, Karachi, Pakistan.

### **PERSONAL INTERESTS**

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- Video gaming, watching movies, astronomy, astrology, social networking.

### **REFERENCE**

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Dept. of Software,  
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