Kao Zhang | Curriculum Vitae

Laboratory of Intelligent Information Processing
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Research Interests

- **Computer Vision**
  Visual (Video/Image/RGBD/VR/UAV) saliency prediction, object detection, tracking, etc.
- **Image/Video Processing**
  Image/Video reframing, image/video denoising, image/video super-resolution etc.

Education

- Ph.D, Photogrammetry and Remote Sensing,
  School of Remote Sensing and Information Engineering, **Wuhan University**   *2016 – 2020*
  (Advisors: Professor Zhenzhong Chen)
- M.Eng, Surveying Engineering,
  School of Remote Sensing and Information Engineering, **Wuhan University**   *2014 – 2016*
  (Advisors: Professor Jian Yao)
- B.Eng, Remote Sensing Science and Technology,
  School of Remote Sensing and Information Engineering, **Wuhan University**   *2010 – 2014*
  (Advisors: Professor Jian Yao)

Publications

- **Kao Zhang**, Zhenzhong Chen. A Spatial-temporal Recurrent Neural Network for Video Saliency Prediction. IEEE Trans. Image Process. (TIP), vol. 30, pp. 572-587, 2021.
- **Kao Zhang**, Zhenzhong Chen. Video Saliency Prediction Based on Spatial-Temporal Two-Stream Network. IEEE Trans. Circuits Syst. Video Technol. (TCSVT), vol. 29, no. 12, pp. 3544-3557, 2019.
- Di Liu, **Kao Zhang**, Zhenzhong Chen. Attentive Cross-Modal Fusion Network for RGB-D Saliency Detection. IEEE Trans. Multimedia (TMM), 2020. https://doi.org/10.1109/TMM.2020.2991523.
- Jing Ling, **Kao Zhang**, Yingxue Zhang, Daiqin Yang, Zhenzhong Chen. A saliency prediction model on 360 degree images using color dictionary based sparse representation. Signal Processing: Image Communication (SPIC), vol. 69, pp. 60-68, 2017.
- Zhaopeng Hu, Daiqin Yang, **Kao Zhang**, Zhenzhong Chen. Object Tracking in Satellite Videos Based on Convolutional Regression Network with Appearance and Motion Features. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS), vol. 13, no. 12, pp. 783-793, 2020.
- Di Liu, Yaosi Hu, **Kao Zhang**, Zhenzhong Chen. Two-stream refinement network for RGB-D saliency detection. in Proc. IEEE International Conference on Image Processing (ICIP), 2019, pp. 3925-3929.
- Xixi Li, Di Liu, **Kao Zhang**, Zhenzhong Chen. Layout-Driven Top-Down Saliency Detection for Webpage. in Proc. Pacific Rim Conference on Multimedia (PCM), 2017: 438-446.
- Ruiqian Zhang, Jian Yao, **Kao Zhang**, Chen Feng and Jiadong Zhang. S-CNN-Based Ship Detection from

High-Resolution Remote Sensing Images. in Proc. International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences (ISPRS), 2016, (**Best Poster Award**).

- Yuan Liu, **Kao Zhang**, Jian Yao, Tong He, Yahui Liu, and Jinge Tu. An Efficient Method for Text Detection from Indoor Panorama Images Using Extremal Regions. in Proc. IEEE International Conference on Information and Automation (ICIA), 2015, oral.

- Tong He, Jian Yao, **Kao Zhang**, Yaolin Hou, Shiyao Han. Accurate Multi-Scale License Plate Localization Via Image Saliency. in Proc. IEEE Conference on Intelligent Transportation Systems (ITSC), 2014, oral.

Patents & Software Copyrights

- Jian Yao, **Kao Zhang**, Tong He, and Sa Zhu. Accurate Multi-Scale License Plate Localization Based on Affine Rectification. Authorization Number: 201410077985.8, 2014. (Patent)

- Jian Yao, **Kao Zhang**, Tong He, Li Li, Yuan Liu, Yinxuan Li, Mengsheng Lu, Jinge Tu. Panorama Post-Processing Software. Authorization Number: 2015R11S199708, 2015. (Software Copyright)

Project Experience

- **Visual attention modeling** *2016–*
  Research and development of visual attention prediction models for natural images/videos, 360 degree images/videos, RGBD images and webpage images. This work is supported by two National Key R&D Programs of China and two National Natural Science Foundations of China. Under this project, I published several papers in TIP/TMM/TCVST/ICIP/PCM, and won four international competition rewards.

- **Spatio-temporal saliency model for drones** *2019–*
  Research and development of saliency prediction algorithms to identify the salient regions of each frame that are likely to draw human's visual attention in drone videos based on deep spatio-temporal features and prior information. It is a collaborative project with IRISA/INRIA, France.

- **Multi-dimensional cooperative monitoring** *2018–*
  Research and development of integration of various advanced technologies of multi-source and multi-dimensional heterogeneous information obtained from spaceborne, airborne, and ground measurements. This work was supported in part by the National Key R&D Programs of China. A journal paper is published in IEEE JSTARS.

- **Object detection** *2014–2016*
  Research and development of object detection models for natural images/videos, high-resolution remote sensing images, 360 degree panoramic images. This work was supported by Natural Science Foundation of Hubei Province of China and Innovation Foundation of China Aerospace Science and Technology Corporation. I published three conference papers, obtained an invention patent license and a software copyright, and received three awards.

Honors & Scholarships

- Grand Winner Prize on Images in ICME2018 Grand Challenge (GC) – Salient360!. 2018
- 1st place on track: Prediction of Head Saliency for Images in ICME2018 GC–Salient360!. 2018
- 1st place on track: Prediction of Head+Eye Saliency for Videos in ICME2018 GC–Salient360!. 2018
- Best Head Movement Prediction Student Prize in ICME2017 GC–Salient360!. 2017
- 2nd place on track: Prediction of Head+Eye Saliency for image in ICME2017 GC–Salient360!. 2017
- Best Poster Award on ISPRS2016. 2016

- Second-Class Prize, The 1st National Graduate Contest on Smart-City Technology and Creative Design, Video Challenge Section, Face Detection. 2014
- Excellent Bachelor's Degree Thesis of Hubei Province and Wuhan University, China. 2014

Technical Skills

- **Programming Languages:** Python (Pytorch/Tensorflow/Keras), MATLAB, C/C++, *etc.*
- **Other:** LaTeX, can write well organised and structured reports.