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SUMMARY

Hardware:

- Familiar with FPGA, CUDA GPU, Raspberry (ARM), etc., embedded platform development.
- Design of general electrical circuits' scheme and PCB.
- Familiar with Bluetooth 4.0, URAT, USB, SPI, I2C, 4G protocol and setup.
- Hands-on experience on application of different sensors, GPS, ultrasound, ToF, UWB, stereo camera, RGB-D camera, Lidar, IMU, Wheel encoder, for state estimation task.

Software

- Hands-on experience on use of "Tensorflow", "PyTorch".
- Familiar with 3D main-stream network models, practical coding experience on MLP-based NeRF and SDF model, CNN, Transformer, Diffusion model for 3D application.
- Familiar with "ColMap", "ORB-RGBD", "Cartographer", "Gmapping", "HectorSLAM", "DSO", "KinectFusion" "VINs", "MSCKF" code framework.
- Filter algorithms, factor graph-based optimization, and open-source libraries, such as ROS, PCL, Octomap, Eigen, Sophus, GTSAM, OpenCV etc.

MAIN RESEARCH INTEREST

VR/AR, Sensor fusion, SLAM, 3D Reconstruction, 3D Geometric Deep Learning.

CODING LANGUAGE

C++ 11, Python, C, Matlab

WORK EXPERIENCE

12/2020—05/2021, Senior Algorithm Engineer, Momenta AI, Parking Department R&D, Suzhou.
09/2018—11/2020, Robot System Engineer, R&D Center at Qualcomm, Peking.
04/2018—09/2018, Research HIWI, Chair of Communication and Navigation, TUM, Munich.
05/2016—08/2016, Internship, Robot Controller Department, ABB Co., Ltd, Shanghai.

EDUCATION

05/2021—present, KU Leuven, PhD student
10/2016—01/2018, Electro & Info Engineering (M.S), Technical University of Munich, GPA 2.1/1.0
09/2014—06/2016, Electro & Info Engineering (M.S), Tongji University, Shanghai, GPA 86.5/100
09/2009—06/2013, Control Engineering (BS), Hangzhou Dianzi University, Hangzhou, GPA 90/100

HOBBY

Chess, Movie, Football, Table Tennis, Music, Hiking, Jogging, Reading, Drawing, Piano Play

PROJECT EXPERIENCE

05/2021-Present, PhD Student, EAVISE Group, Department of Electrical Engineering, KU Leuven, Belgium. PhD Topic: Geometric Deep Learning
a. Supervised a bachelor student on "Visual-inertial sensor fusion by template-based particle filter for aerial gimbal platform, accepted by ICRA 2023, London).
b. Supervised a master student individually on "Surfel based Large Scale 3D Mapping based on MSCKF", master thesis finalized.
c. 3D Project guided by Prof. Matthias Niessner from TUM, Germany, on "Implicit Network Model for ill-posed Shape Completion", experiments ongoing.
d. FocDepthFormer: depth estimation from focal stack image by Transformer. Paper submitted to ICCV.
e. SDF2NeRF: implicit network for Neural radiance guidance for RGB-D view synthesis, Paper finalized. (Collaborated with Byte Dance AI lab remotely)

12/2020—05/2021, Momenta AI. Senior Software Engineer, R&D Center, Suzhou.
a. Fusion of ultra-sonic sensor and edge detection from image for obstacle avoidance.
b. IMM based filter along with Ackermann kinematic constraints for vehicle tracking.
c. Active search of empty parking lots and perception fusion.
d. 3D ground line fusion for static obstacles like pillar, wall, stepper.

09/2018—11/2020, Qualcomm, System Engineer, R&D Center, Robotic Visual Group, Beijing.
a. Calibration for camera intrinsic and extrinsic, alignment and synchronization of RGB-D images.
b. VIO improved by EIS (IMM tracking + imu pre-integration) to improve image equality for tracking.
c. IR+RGB based feature tracking fusion to support long-term SLAM over day and night.
d. Research on integration of object-level semantic information into geometric IoU based data association, to improve pose estimation accuracy and robustness.

e. Programmed the EKF based framework, VO being loosely coupled with IMU, wheel encoder.

03/2020—09/2020, Learner, Enrolled at Shenlan "VIO Code Programming", online, 8 big projects.

02/2018—08/2018, Learner, Enrolled at Udacity 2 Nanodegree Programs, online: a) "Robot Software Engineer" Nanodegree Program, 9 big projects b) "Flying Car" Nanodegree Program, 4 big projects.

04/2018-09/2018, **Research Assistant, Chair of Navigation & Communication, TUM, Munich**
a. Mitigated the stereo camera Bumblebee, and Decawave UWB driver, wrapped in ROS.
b. Built the synchronization framework for image pair and UWB via hardware triggering.
c. Adaptive Fusion of UWB for scale recovery, and drift correction in large scale SLAM.

04/2017—01/2018, Master Student, Master thesis (3D reconstruction & assessment framework based on 2D Lidar), TUM, Munich.
a. Set up SLAM hardware framework all from scratch, including the driver programming, environment and communication setup between Raspi and PC.
b. Wrote the fusion algorithm for measurements from two 2D Lidars and attitude estimation from IMU, generated a 3D mapping along motion.
c. Designed a kit for 3D scanning at fixed locations, the scanning at multiple fixed locations can be merged automatically by point-to-plane ICP.
d. Designed and programmed the Octomap based metrics for offline comparison between the reference map and the query map, to evaluate the map quality quantitatively. Code link.

09/2012—03/2013, Smart control Power Lab, Hangzhou Dianzi University, Hangzhou.
a. Took responsibility in Power-Circuit, and DC-DC maximal power tracing algorithm design.
b. Programmed the Maximal Power Point Tracking (MPPT) algorithm and realized on DSP. Involved to make a system prototype, tested the hardware with DSP controller flashed with MPPT algorithm.
c. Won the 2nd Prize during 13th "Challenge Cup" National College Students extra-curricular Science and Technology Works Competition in Zhejiang Province (DC-AC Micro Converter).
d. Won the 3rd Prize during 1st "Texas Instrument, China National Control and Instrument Innovation Design Competition, Please check the Website at: TI-Cup-Certificate.

PUBLICATIONS

Under review:
1. FocDepthFormer: Transformer with LSTM for Depth Estimation from Focus. (Under review, IEEE Transaction of Multi-Media 2023)
2. Leveraging SDF geometry Prior for Neural Radiance Field Rendering in Challenging Views. (Submitted to CVPR 2024)

Public:
1. Kang Xueyang, Ariel Herrera, and Henry Lema. "Hierarchical Sampling based Particle Filter for Visual-inertial Gimbal in the Wild." arXiv preprint arXiv:2206.10981 (Accepted by ICRA 2023) Full paper link
2. Kang Xueyang, Yuan s. "Robust Data Association for Object-level Semantic SLAM". Full paper link
3. Kang Xueyang, Yin S., and Feng Y., "3D Reconstruction & Assessment Framework based on affordable 2D Lidar," 2018 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Auckland, New Zealand,2018, pp. 292-297. Full paper link, Demo link
4. Kang Xueyang, Wang Lei, "Design of fault analysis and test equipment for C919 aircraft landing gear", Journal of Electronic Measurement Technology, China. ISSN:1002-7300. CN:11-2175/TN, 2017, 40(1).
5. Kang Xueyang, Xue Chu, MPPT (Maximum Power Point Tracking) algorithm for photovoltaic DC-DC optimizer. Zhejiang Institute of Electronics. Proceedings of Zhejiang Institute of Electronics 2012 Annual Conference[C], 2012: 4.

PATENTS.

1. Xueyang Kang, Jun Wu, et al, "Vision based 3D obstacle groundline fusion framework". CN Patent (In Application)

2. Xueyang Kang, Leixu, et al, "Collaborative visual SLAM system for wide range of light spectrum". PCT patent (PCT/CN2020/119769)

3. Xueyang Kang, Shunying Yuan, "Robust VIO + EIS module design for mobile applications". PCT patent (PCT/CN2021/070099)

4. K Xueyang, D Xueqing, W QiuXuan, S Yuhong, W Lin, "Self-tuning photovoltaic power optimizer based on dc-dc transform". CN Patent (CN202,406,064U)

5. K Xueyang, D Xueqing, W Maogang, S Yuhong, X Hongfei, "Power supply and control system for solar tour boat". CN Patent (CN202,405,848U)