KIERAN SAUNDERS

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PROFESSIONAL SUMMARY

PhD candidate specialising in 3D machine perception and generative AI, with first-authored publications at top-tier conferences (ICCV, BMVC). Proven ability to architect and prototype novel deep learning systems for 3D reconstruction, monocular depth, and video understanding. Experienced in engineering efficient, end-to-end solutions for creating digital twins and enabling AR/VR experiences. Seeking to apply deep learning and computer vision expertise to solve challenging problems in autonomous systems, robotics, and spatial computing.

EDUCATION

PhD in Computer Science, Aston University 2022 - Expected 2025

Focus: Self-Supervised Monocular Depth Estimation. Research, part-sponsored by Aurrigo, addresses autonomous vehicle navigation and 3D scene understanding.

BSc in Mathematics, Aston University, First-Class Honours with Departmental Prize 2019 - 2022

TECHNICAL SKILLS

- **3D Vision**: Egocentric Reconstruction, Monocular Depth, Semantic Understanding, SLAM, Novel View Synthesis, Gaussian Splatting, Pose Estimation.
- **Machine Learning**: Deep/Self-Supervised Learning (PyTorch), Generative Models (GANs, Diffusion), Video Understanding, Real-Time Inference.
- **Software & Tools**: Python, C++, Git, Docker, SLURM, FFmpeg, Linux.
- **Sensors & Fusion**: RGB/RGB-D, IMU, GPS; experience with multimodal fusion and egocentric systems.
- **Core Engineering**: System Prototyping, Real-Time Performance, Documentation, Cross-Functional Collaboration.

RESEARCH AND PROJECTS

RobuSSt3R Current, First Author

- Developing a state-of-the-art self-supervised system for monocular depth and egocentric 3D reconstruction from unstructured video.
- Achieves robust, geometrically consistent results for scalable digital twin creation, even in adverse conditions.

GRASP3R Current, First Author

- Developed the first end-to-end system for 7-DoF egocentric grasping and object pose estimation using only unposed, uncalibrated RGB input. This work advances the understanding of user actions and human-object interactions in 3D.

BaseBoostDepth BMVC 2024, First Author

- Engineered a curriculum learning strategy for self-supervised egocentric depth, achieving SOTA results (KITTI, SYNS-Patches) with high-quality 3D reconstruction and efficient inference.

RobustDepth ICCV 2023, First Author

- Developed robust egocentric depth models using synthetic data and augmentation to achieve SOTA performance in challenging conditions, demonstrating expertise in dataset creation and resilience testing.

PROFESSIONAL EXPERIENCE

Doctoral Researcher (Industrial Collaboration), Aurrigo Current

- Leading R&D of deep learning VSLAM for robust navigation and localisation in dynamic airport environments. Prototyping real-time 3D reconstruction systems for digital twin creation, with a focus on efficient on-device deployment for autonomous vehicles.

Machine Learning Intern (High-Achievers Programme), Lampix Winter 2021

- Selected for an intensive AI programme (from 200+ applicants), developing and deploying an end-to-end CNN for liquid level detection via 3D inference from 2D images.

LEADERSHIP & TEACHING

- **Teaching Assistant**: Image and Video Processing (CS3IVP), Data Mining (CS3DM), Machine Learning (CS4730P1A), Aston University.
- **Mentor**: Guided PhD and Master's students in deep learning and 3D vision projects, fostering a collaborative research environment.
- **HPC Administrator**: Administered the university HPC cluster, managing GPU resources and maintenance to support large-scale AI research.

PUBLICATIONS

- **Saunders, K.**, et al. "GRASP3R: Unposed and Uncalibrated RGB Robotic Object Grasping and Pose Estimation.", 2024. (Under Review, First Author)
- **Saunders, K.**, et al. "BaseBoostDepth: Exploiting Larger Baselines For Self-supervised Monocular Depth Estimation." *British Machine Vision Conference (BMVC)*, 2024. (First Author)
- **Saunders, K.**, et al. "Self-supervised monocular depth estimation: Let's talk about the weather." *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2023. (First Author)
- **Saunders, K.**, et al. "Dyna-dm: Dynamic object-aware self-supervised monocular depth maps." *IEEE International Conference on Autonomous Robot Systems and Competitions (ICARSC)*, 2023. (First Author)