SINGLE IMAGE DEPTH ESTIMATION USING DEEP ADVERSARIAL TRAINING

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MOTIVATION

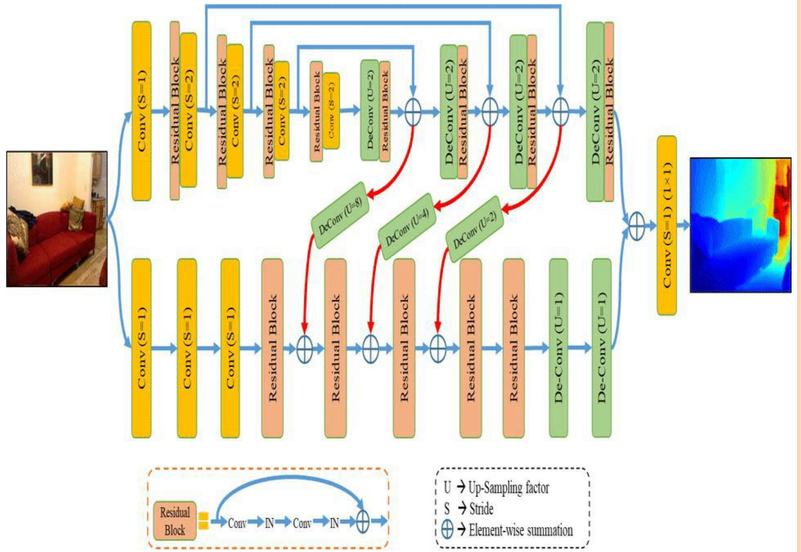
- The LiDARs and stereo depth sensor have their own restrictions such as light sensitiveness, power consumption, and short-range.
- One of the major base path of stereo cameras is, it requires attentive calibration for reliable camera triangulation and enormous computational power.
- The stereo cameras often fail to estimate the scene depth for shiny, bright, transparent, and distant surfaces.
- To address this constraint, we have proposed the single image depth estimation network using deep adversarial training.

QUANTITATIVE RESULTS

Table 1. Quantitative Analysis of Single Image Depth Estimate on NYU RGB-D v2 Database

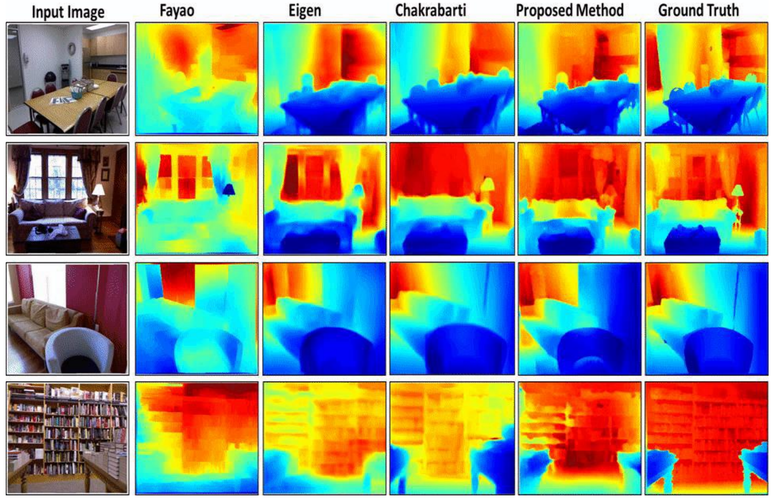
Methods	Rel	RMS	RMS(log)	log10
Karsch et al.	0.374	1.120	-	0.314
Liu et al.	0.335	1.060	-	0.127
Li et al.	0.232	0.821	-	0.094
Liu et al.	0.230	0.824	-	0.095
Wang et al.	0.220	0.745	0.262	0.094
Eigen et al.	0.215	0.907	0.285	-
Roy et al.	0.187	0.744	-	0.078
Ayan et al.	0.149	0.620	0.205	-
Eigen et al.	0.158	0.641	0.214	-
Zheng et al.	0.157	0.556	0.199	-
Proposed Method	0.141	0.501	0.079	0.059

PROPOSED NETWORK



SAMPLE RESULTS

QUALITATIVE RESULTS



CONCLUSION

- The performance evaluation of the proposed network is increased by the two streams deep network architecture along with feature map sharing approach.
- The proposed network can be utilized for other computer vision applications such as sematic segmentation and image deblurring.

REFERENCES

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- Chakrabarti et al., “Depth from a single image by harmonizing overcomplete local network predictions”, NIPS 2016.
- Zheng et al., “T2net: Synthetic-to-realistic translation for solving single-image depth estimation tasks”, ECCV 2018.