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# **QEKF**

KITTI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **EightPt** | **Nister** | **Kukelova** | **QuEst** | **VEst** |
| **T err mean** | 0.1549 | 0.1506 | 0.2007 | 0.0677 | 0.1069 |
| **T err std** | 0.1307 | 0.1168 | 0.0961 | 0.0431 | 0.0641 |
| **T err med** | 0.0988 | 0.1135 | 0.1937 | 0.0573 | 0.0801 |
| **T err Q1** | 0.0328 | 0.0583 | 0.1249 | 0.0436 | 0.0630 |
| **T err Q3** | 0.2471 | 0.2132 | 0.2801 | 0.0767 | 0.1564 |
| **Q err mean** | 0.2424 | 0.0319 | 0.0340 | 0.0201 | 0.0470 |
| **Q err std** | 0.1289 | 0.0506 | 0.0499 | 0.0457 | 0.0660 |
| **Q err med** | 0.2705 | 0.0203 | 0.0204 | 0.0074 | 0.0187 |
| **Q err Q1** | 0.1516 | 0.0083 | 0.0089 | 0.0039 | 0.0071 |
| **Q err Q3** | 0.3369 | 0.0236 | 0.0264 | 0.0112 | 0.0487 |

# **VEst**

Since VEst outputs V and W, we compute the integral of the two and compute the error with respect to the ground truth for each frame.

KITTI

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| --- | --- |
|  | **VEst** |
| **T err mean** | 0.4516 |
| **T err std** | 0.3953 |
| **T err med** | 0.2134 |
| **T err Q1** | 0.0733 |
| **T err Q3** | 0.8581 |
| **Q err mean** | 0.0470 |
| **Q err std** | 0.0660 |
| **Q err med** | 0.0187 |
| **Q err Q1** | 0.0071 |
| **Q err Q3** | 0.0487 |

# **QEKF**

KITTI

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| --- | --- | --- | --- | --- | --- |
|  | **EightPt** | **Nister** | **Kukelova** | **QuEst** | **VEst** |
| **GT-X T err mean** | 0.4215 | 0.3382 | 0.3925 | 0.3404 | 0.2800 |
| **GT-X T err std** | 0.3045 | 0.2134 | 0.1581 | 0.2894 | 0.2363 |
| **GT-X T err med** | 0.5248 | 0.3007 | 0.4235 | 0.2332 | 0.1898 |
| **GT-X T err Q1** | 0.0489 | 0.1524 | 0.2397 | 0.0855 | 0.1028 |
| **GT-X T err Q3** | 0.7230 | 0.4549 | 0.5244 | 0.5372 | 0.4329 |
| **GT-X Q err mean** | 0.3423 | 0.3423 | 0.3423 | 0.3423 | 0.3423 |
| **GT-X Q err std** | 0.0331 | 0.0331 | 0.0331 | 0.0331 | 0.0331 |
| **GT-X Q err med** | 0.3337 | 0.3337 | 0.3337 | 0.3337 | 0.3337 |
| **GT-X Q err Q1** | 0.3331 | 0.3331 | 0.3331 | 0.3331 | 0.3331 |
| **GT-X Q err Q3** | 0.3340 | 0.3340 | 0.3340 | 0.3340 | 0.3340 |
| **GT-X V err mean** | 0.5218 | 0.6064 | 0.5494 | 0.4985 | 0.5291 |
| **GT-X V err std** | 0.2996 | 0.2365 | 0.1774 | 0.2879 | 0.2931 |
| **GT-X V err med** | 0.5832 | 0.5342 | 0.5366 | 0.4963 | 0.5043 |
| **GT-X V err Q1** | 0.2120 | 0.4608 | 0.4805 | 0.2111 | 0.2209 |
| **GT-X V err Q3** | 0.7951 | 0.8449 | 0.6314 | 0.8562 | 0.8323 |
| **Z-X T L1 mean** | 38546866980459981474093041858046546307895183481983 | 43405475226969366839931327962541144989787353208403 | 44860372308770192319458026901351751228910266832009 | 29703980755763936066568842017244800439154682574041 | 26867769247134955871373127072130208366592.0000 |
| **Z-X T L1 std** | 14422916957443061613186543692258929977879794536550 | 16240841700942328257398597105551835018022185423514 | 16785214342253918184510956226195309246464090935667 | 11114211901139510894470649357228146938725151384840 | 100529987269680241109660366187213384318976.0000 |
| **Z-X T L1 med** | 267432498.0705 | 1.7014 | 22.6788 | 1.4049 | 1.0263 |
| **Z-X T L1 Q1** | 0.5785 | 1.3265 | 1.8331 | 0.4877 | 0.4840 |
| **Z-X T L1 Q3** | 74283746670127958867845283921652099384595087297231 | 237665722.0126 | 18324338635669475367339693693454227785985801846784 | 3034606558277402651364754222574638989312.0000 | 47.1325 |
| **Z-X Q L1 mean** | 1.6013 | 1.0793 | 1.0890 | 1.0414 | 1.1403 |
| **Z-X Q L1 std** | 0.3298 | 0.0765 | 0.0761 | 0.0367 | 0.2012 |
| **Z-X Q L1 med** | 1.8094 | 1.0489 | 1.0886 | 1.0373 | 1.0779 |
| **Z-X Q L1 Q1** | 1.3442 | 1.0297 | 1.0278 | 1.0138 | 1.0150 |
| **Z-X Q L1 Q3** | 1.8354 | 1.0985 | 1.1095 | 1.0495 | 1.1798 |
| **Z-X V L1 mean** | 25749641023514299979736987383821852106040744865396 | 11086569477967216686358450840266231062352083278945 | 15036988138195730044820678898990785770876532233769 | 14078561467457552010890232485557517455249128518012 | 552687955587104859503441802929653313175552.0000 |
| **Z-X V L1 std** | 96346334542409611704741791523089896248353702267907 | 41482144581218554092676810428587711990494294041256 | 56263257742112177338476049957949215651485188113844 | 52677153509863524669863462296193930330629490933995 | 2067968971603478568871377343116402696912896.0000 |
| **Z-X V L1 med** | 24927872.3021 | 0.1957 | 2.2130 | 0.2722 | 0.1978 |
| **Z-X V L1 Q1** | 0.0697 | 0.1039 | 0.1223 | 0.0762 | 0.0681 |
| **Z-X V L1 Q3** | 35273963021829599433529571644480656552037402825940 | 24147456.7258 | 5332611193275686203026309655739922739705424117760. | 30660652309097688019142085053262203977728.0000 | 4.4554 |
| **Z-X T L2 mean** | 94340524809342550551256561204490219208401804310610 | 15937671917186606735730086190437947665509831565461 | 21790457424670482980020334098914517613615606385571 | 93272580742472763632898433793353199063700042007413 | 73753526441441123433115834118026276712648946187601 |
| **Z-X T L2 std** | inf | 59633307856920867891900757349507964176749440085708 | inf | inf | 27596042701024534612547640678895144792169576097523 |
| **Z-X T L2 med** | 28351589145907844.0000 | 1.3167 | 320.0627 | 1.0000 | 0.5305 |
| **Z-X T L2 Q1** | 0.3043 | 0.9050 | 1.3349 | 0.1457 | 0.1283 |
| **Z-X T L2 Q3** | 25361879670009700545428878757042356320039764551339 | 41666929522905768.0000 | 32736692268947866419667273107248076904009116930914 | 46693360967812426635616629871492302438768808251349 | 1311.1065 |
| **Z-X Q L2 mean** | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| **Z-X Q L2 std** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Z-X Q L2 med** | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| **Z-X Q L2 Q1** | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| **Z-X Q L2 Q3** | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| **Z-X V L2 mean** | 82341382426642850508092034902796242250655898025232 | 16874957242049968724990280565450571032106474757949 | 30976551443255594241142823653318586711425982329075 | 20722647237091057271533327248128984973150955029953 | 27455266364807020162486912847340163744060901474461 |
| **Z-X V L2 std** | inf | 63140308416210682909200212850339552046492149768577 | inf | inf | 10272820019972632210398362695393957737888661220787 |
| **Z-X V L2 med** | 283521169625726.5000 | 0.0244 | 2.9300 | 0.0298 | 0.0190 |
| **Z-X V L2 Q1** | 0.0053 | 0.0056 | 0.0070 | 0.0039 | 0.0039 |
| **Z-X V L2 Q3** | 74148498488652459234252363079925045181472759162064 | 416673398308665.1250 | 28139392463375120343074059400241985770800581575263 | 11974949918006408583760140983860768063988789542239 | 12.5497 |