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# **QEKF**

KITTI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **EightPt** | **Nister** | **Kukelova** | **QuEst** | **VEst** |
| **T err mean** | 0.1549 | 0.1506 | 0.2007 | 0.0677 | 0.0739 |
| **T err std** | 0.1307 | 0.1168 | 0.0961 | 0.0431 | 0.0879 |
| **T err med** | 0.0988 | 0.1135 | 0.1937 | 0.0573 | 0.0461 |
| **T err Q1** | 0.0328 | 0.0583 | 0.1249 | 0.0436 | 0.0180 |
| **T err Q3** | 0.2471 | 0.2132 | 0.2801 | 0.0767 | 0.0973 |
| **Q err mean** | 0.2424 | 0.0319 | 0.0340 | 0.0201 | 0.0312 |
| **Q err std** | 0.1289 | 0.0506 | 0.0499 | 0.0457 | 0.0500 |
| **Q err med** | 0.2705 | 0.0203 | 0.0204 | 0.0074 | 0.0127 |
| **Q err Q1** | 0.1516 | 0.0083 | 0.0089 | 0.0039 | 0.0028 |
| **Q err Q3** | 0.3369 | 0.0236 | 0.0264 | 0.0112 | 0.0421 |

# **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** | 0.5478 |
| **T err std** | 0.4325 |
| **T err med** | 0.8727 |
| **T err Q1** | 0.0619 |
| **T err Q3** | 0.9597 |
| **Q err mean** | 0.0312 |
| **Q err std** | 0.0500 |
| **Q err med** | 0.0127 |
| **Q err Q1** | 0.0028 |
| **Q err Q3** | 0.0421 |

# **QEKF**

KITTI

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| --- | --- | --- | --- | --- | --- |
|  | **EightPt** | **Nister** | **Kukelova** | **QuEst** | **VEst** |
| **GT-X T err mean** | 0.3258 | 0.4068 | 0.4127 | 0.2370 | 0.2598 |
| **GT-X T err std** | 0.2909 | 0.2367 | 0.1813 | 0.2524 | 0.2557 |
| **GT-X T err med** | 0.1847 | 0.4052 | 0.4661 | 0.0932 | 0.1145 |
| **GT-X T err Q1** | 0.0420 | 0.1771 | 0.2386 | 0.0572 | 0.0391 |
| **GT-X T err Q3** | 0.5365 | 0.6021 | 0.5336 | 0.4753 | 0.4583 |
| **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** | 0.6056 | 0.4844 | 0.4560 | 0.4546 | 0.5262 |
| **GT-X V err std** | 0.2717 | 0.2423 | 0.1660 | 0.3475 | 0.3311 |
| **GT-X V err med** | 0.5243 | 0.4493 | 0.4717 | 0.5378 | 0.4909 |
| **GT-X V err Q1** | 0.4237 | 0.3497 | 0.4022 | 0.1088 | 0.2534 |
| **GT-X V err Q3** | 0.8732 | 0.7263 | 0.5552 | 0.7874 | 0.8656 |
| **Z-X T L1 mean** | 63670077881104764371037329620890809613186883501055 | 17941628831078492499425821055952464946058263868991 | 15060131170773165506611746265507962124322824600987 | 18629217958118672509835680857021072022918240497827 | 22031663659690118554559893595663056694277152427800 |
| **Z-X T L1 std** | 23823161722030778805239227938493800195200184435862 | 67131428046561172263576312886383734865236240957905 | 56349851040907890303164274533152244106889938089427 | 69704150982816482608583594488709118113642817339260 | 82434937075198536260903267293127528599611409758261 |
| **Z-X T L1 med** | 507815230.1766 | 1.7021 | 21.1166 | 0.5303 | 1.7529 |
| **Z-X T L1 Q1** | 0.5668 | 1.3329 | 1.8331 | 0.3620 | 0.7081 |
| **Z-X T L1 Q3** | 15991012627317262503829416138800323021302223722421 | 260373910.2683 | 53156742565495092300705977539071557172024531589529 | 6716869.9819 | 126238628321769648.0000 |
| **Z-X Q L1 mean** | 1.6364 | 1.0793 | 1.0890 | 1.0467 | 1.0765 |
| **Z-X Q L1 std** | 0.3335 | 0.0765 | 0.0761 | 0.0351 | 0.0896 |
| **Z-X Q L1 med** | 1.8345 | 1.0489 | 1.0886 | 1.0383 | 1.0399 |
| **Z-X Q L1 Q1** | 1.4466 | 1.0297 | 1.0278 | 1.0239 | 1.0148 |
| **Z-X Q L1 Q3** | 1.8595 | 1.0985 | 1.1095 | 1.0569 | 1.0867 |
| **Z-X V L1 mean** | 71166581498418901739770842137012128743893694348119 | 19017490752497414318759089754579475759121865925785 | 14362044650878880294501904325751815802418676836540 | 16686673829654756260909341827144807743536391933394 | 32251028664969122206621849843838898771239052102744 |
| **Z-X V L1 std** | 26628096535500884101349640855399345939750395256449 | 71156934751987043959925956049813317831045366009770 | 53737850457138134601146050892170273846665274111792 | 62435816395415135877276232859706979271607935410634 | 12067229963533985726856421220698518142608069380512 |
| **Z-X V L1 med** | 59322821.3873 | 0.2021 | 2.3529 | 0.1335 | 0.1366 |
| **Z-X V L1 Q1** | 0.0281 | 0.0474 | 0.0663 | 0.0302 | 0.0265 |
| **Z-X V L1 Q3** | 34773331724461793853910561443202188401583922023427 | 26454663.3050 | 12879974481600103359875044706467413178266333636198 | 668141.2907 | 12759270642397806.0000 |
| **Z-X T L2 mean** | 38600817184518844242078181999624239719551868475008 | 20872037379103485789964157694260996851390182706827 | 22550126525640065116549938491013646513068919771362 | 34161091833126253357764333139390319854674333688769 | 41809254815774684976255801430202914068469452451613 |
| **Z-X T L2 std** | inf | 78096012836544364971069558961758407623219585113767 | inf | 12781910159767981917238247355218038583227990663812 | 15643590711695735658672029697329718608595094515334 |
| **Z-X T L2 med** | 180538112249918912.0000 | 1.3179 | 278.2463 | 0.1439 | 1.2520 |
| **Z-X T L2 Q1** | 0.2978 | 0.9587 | 1.2623 | 0.0747 | 0.1924 |
| **Z-X T L2 Q3** | 17301500984374574355731097765632409934090493508537 | 50009487928770960.0000 | 29511947282981415371392442158701306679656165643075 | 28850769654358.8359 | 10486981955326177635929872914186240.0000 |
| **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** | 71829245049193576894505407688564171592647070864562 | 28160905789618825508998944858272554883635076385886 | 20209923697439829165292608737959970505994064107232 | 19000912899443685514913218568985871300696578072567 | 67766315310950246653724206997552994026702706689597 |
| **Z-X V L2 std** | inf | 10536846116597232613741839908642969399062658163559 | inf | 71094906105651750646083238163488936896009165453511 | 25355833425766903764426626478057438298894238024057 |
| **Z-X V L2 med** | 1805914903403522.0000 | 0.0191 | 2.8748 | 0.0163 | 0.0127 |
| **Z-X V L2 Q1** | 0.0006 | 0.0011 | 0.0020 | 0.0004 | 0.0005 |
| **Z-X V L2 Q3** | 14648330446719739806470965837235285530844151997169 | 500099803134814.8125 | 18534540463684416892995570405920998393643955265996 | 288502886423.5827 | 104870626030535664912214855254016.0000 |