|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Some benchmark of MOT2015 (test)** | | | | | |
| RANK | Algorithm | MOTA | IDsw | Average FPS | Detector |
| 1 | [KCF](https://motchallenge.net/tracker/KCF) | 38.9 ± 14.5 | 720 (13.9) | 0.3 | Public |
| … | … | … | … | … | Public |
| 15 | [DCCRF](https://motchallenge.net/tracker/DCCRF) | 33.6 ± 11.0 | 866 (19.4) | 0.1 | Public |
| … | … | … | … | … | Public |
| 26 | MDP | 30.3 ± 14.6 | 680 | 1.1 | Public |
| … | … | … | … | … | Public |
| 41 | DAC\_min | 26.1 ± 13.5 | 506 | 11.6 | Public |
| … | … | … | … | … | Public |
| 60 | LP2D | 19.8 ± 14.2 | 1649 | 112.1 | Public |
| … | … | … | … | … | Public |
| **65** | **Ours** | **19.5±15.5** | **1289** | **21.4** | **Private** |
| 66 | RNN\_LSTM | 19.0 ± 15.2 | 1490 | 165.2 | Public |
| 67 | RMOT | 18.6 ± 17.5 | 684 | 7.9 | Public |
| … | … | … | … | … | Public |
| 71 | GSCRR | 15.8 ± 10.5 | 514 | 28.1 | Public |
| … | … | … | … | … | Public |
| 75 | DP\_NMS | 14.5 ± 14.5 | 4,537 | 444.8 | Public |
| 76 | LDCT | 4.7 ± 41.3 | 12,348 | 20.7 | Public |

MOT challenge Website: <https://motchallenge.net/results/2D_MOT_2015/?chl=2&orderBy=MOTA&orderStyle=ASC&det=Public>

NOTE: the other models above use provided detection result and only ran tracker for the evaluation. Our model run both detection (YOLOv3 tiny) and tracker (modified Deep SORT).

# **ALL SUMMARY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FULL TABLE (ALL) [Only choose the skip1 for comparison]** | | | | |
| Algorithm | MOTA | IDsw | Average FPS | Some metrics? |
| Vanilla YOLOv3 Tiny + Deep SORT | 33.6% | 635 | 9.997820328723746 |  |
| YOLOv3 Tiny + Deep SORT (skip1) | 30.7% | 570 | 21.04679665688465 |  |
| YOLOv3 Tiny + Deep SORT (skip1 with probability-driven) | 31.0% | 594 | 20.462735731270826 |  |
|  |  |  |  |  |
| Vanilla Mobilenet SSD + Deep SORT | 19.0% | 577 | 9.8474409913098 |  |
| Mobilenet SSD + Deep SORT (skip1) | 17.7% | 520 | 15.964183221155363 |  |
| Mobilenet SSD + Deep SORT (skip1 with probability-driven) | 18.0% | 523 | 14.404656840037314 |  |
|  |  |  |  |  |
| Vanilla Squeezenet\_1\_0 + Deep SORT | 9.9% | 484 | 20.042197668270926 |  |
| Squeezenet 1.0 + Deep SORT (skip1) | 9.3% | 470 | 33.892409156740605 |  |
| Squeezenet 1.0 + Deep SORT (skip1 with probability-driven) | 9.4% | 475 | 32.83395018961477 |  |
|  |  |  |  |  |

# **YOLOv3 Tiny + Deep SORT**

|  |  |  |  |
| --- | --- | --- | --- |
| **FULL TABLE (YOLOv3\_tiny + Deep SORT)** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla YOLOv3 Tiny + Deep SORT | 33.6% | 635 | 10.91483091271569 |
| YOLOv3 Tiny + Deep SORT with Down Sampling | 32.8% | 651 | 13.502331711038652 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame | 30.6% | 570 | 19.37849194020307  (latest:21.04679665688465) |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Down Sampling | 29.9% | 577 | 20.99770992639639 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven | 31.0% | 594 | 17.687353215558588  (latest:20.46273573127082) |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling | 30.4% | 601 | 19.712947568039144 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame | 26.2% | 581 | 24.256086156797263 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Down Sampling | 25.5% | 538 | 26.168741967543177 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven | 28.1% | 581 | 21.479398919731597 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling | 27.2% | 561 | 23.43272825379938 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 3 Skip Frame | 21.4% | 732 | 27.17888721926881 |
| YOLOv3 Tiny + Deep SORT with 3 Skip Frame and Down Sampling | 21.2% | 729 | 29.893118061828474 |
| YOLOv3 Tiny + Deep SORT with 3 Skip Frame and Probability Driven | 24.4% | 720 | 24.071292701682104 |
| YOLOv3 Tiny + Deep SORT with 3 Skip Frame and Probability Driven and Down Sampling | 24.1% | 676 | 26.58001187446766 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame | 17.3% | 858 | 30.7455967240831 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Down Sampling | 17.2% | 826 | 32.88588810729369 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven | 22.0% | 778 | 26.199336450564576 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling | 21.7% | 721 | 28.336271278397096 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 5 Skip Frame | 13.8% | 871 | 33.1634016095078 |
| YOLOv3 Tiny + Deep SORT with 5 Skip Frame and Down Sampling | 13.6% | 819 | 35.495408777649196 |
| YOLOv3 Tiny + Deep SORT with 5 Skip Frame and Probability Driven | 20.3% | 786 | 27.908364645956375 |
| YOLOv3 Tiny + Deep SORT with 5 Skip Frame and Probability Driven and Down Sampling | 18.9% | 795 | 30.19416683885809 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame | 11.4% | 812 | 35.37700094177629 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Down Sampling | 11.0% | 824 | 37.192013066238104 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven | 17.8% | 750 | 28.97554816233987 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling | 17.2% | 771 | 31.403710279478073 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 7 Skip Frame | 8.8% | 831 | 36.69362283873649 |
| YOLOv3 Tiny + Deep SORT with 7 Skip Frame and Down Sampling | 8.5% | 821 | 38.73970200190891 |
| YOLOv3 Tiny + Deep SORT with 7 Skip Frame and Probability Driven | 15.9% | 821 | 30.685951335910243 |
| YOLOv3 Tiny + Deep SORT with 7 Skip Frame and Probability Driven and Down Sampling | 15.0% | 790 | 33.450852756265625 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 8 Skip Frame | 6.8% | 832 | 38.141400874916755 |
| YOLOv3 Tiny + Deep SORT with 8 Skip Frame and Down Sampling | 6.2% | 820 | 40.26659519478607 |
| YOLOv3 Tiny + Deep SORT with 8 Skip Frame and Probability Driven | 13.6% | 816 | 31.7064167890517 |
| YOLOv3 Tiny + Deep SORT with 8 Skip Frame and Probability Driven and Down Sampling | 13.2% | 800 | 34.11690588833806 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 9 Skip Frame | 5.2% | 774 | 39.11637415522933 |
| YOLOv3 Tiny + Deep SORT with 9 Skip Frame and Down Sampling | 5.0% | 759 | 41.54897992498731 |
| YOLOv3 Tiny + Deep SORT with 9 Skip Frame and Probability Driven | 11.5% | 779 | 34.267741847251465 |
| YOLOv3 Tiny + Deep SORT with 9 Skip Frame and Probability Driven and Down Sampling | 10.6% | 796 | 36.149916359826285 |
| … |  |  |  |
| YOLOv3 Tiny + Deep SORT with 10 Skip Frame | 2.9% | 768 | 40.17551909751923 |
| YOLOv3 Tiny + Deep SORT with 10 Skip Frame and Down Sampling | 2.9% | 768 | 42.46852955687042 |
| YOLOv3 Tiny + Deep SORT with 10 Skip Frame and Probability Driven | 9.5% | 793 | 34.33952922260652 |
| YOLOv3 Tiny + Deep SORT with 10 Skip Frame and Probability Driven and Down Sampling | 9.1% | 770 | 36.742833768287326 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Down Sampling** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla YOLOv3 Tiny + Deep SORT | 33.6% | 635 | 9.997820328723746 |
| YOLOv3 Tiny + Deep SORT with Down Sampling | 32.9% | 651 | 11.996064715800753 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame | 30.7% | 570 | 16.56956741670473 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Down Sampling | 30.0% | 577 | 20.99549490626117 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame | 26.3% | 581 | 20.68914912740483 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Down Sampling | 25.6% | 538 | 25.16089209909558 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame | 17.4% | 858 | 30.685362182060103 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Down Sampling | 17.3% | 826 | 32.71531749075337 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame | 11.5% | 809 | 35.487960011851555 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Down Sampling | 11.1% | 821 | 36.79384991372523 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Skipping Frame** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla YOLOv3 Tiny + Deep SORT | 33.6% | 635 | 9.997820328723746 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame | 30.7% | 570 | 16.56956741670473 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame | 26.3% | 581 | 20.68914912740483 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame | 17.4% | 858 | 30.685362182060103 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame | 11.5% | 809 | 35.487960011851555 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Using probability Driven Detection** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla YOLOv3 Tiny + Deep SORT | 33.6% | 635 | 9.997820328723746 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame | 30.7% | 570 | 18.56956741670473 |
| YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven | 31.0% | 594 | 17.757431631657468 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame | 26.3% | 581 | 22.68914912740483 |
| YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven | 28.2% | 581 | 21.671446463250184 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame | 17.4% | 858 | 30.685362182060103 |
| YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven | 22.0% | 778 | 26.27376224976722 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame | 11.5% | 809 | 35.487960011851555 |
| YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven | 17.7% | 758 | 28.440129230784574 |
|  |  |  |  |

# **Mobilenet SSD + Deep SORT**

|  |  |  |  |
| --- | --- | --- | --- |
| **FULL TABLE (Mobilenet SSD + Deep SORT)** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Mobilenet SSD + Deep SORT | 19.0% | 577 | 9.604095582070949 |
| Mobilenet SSD+ Deep SORT with Down Sampling | 17.5% | 647 | 9.587366376720645 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame | 17.6% | 520 | 16.40143629589119 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame and Down Sampling | 16.6% | 569 | 16.20803506565245 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven | 18.0% | 523 | 14.637242356905144 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling | 16.8% | 573 | 15.00819154341061 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame | 15.6% | 494 | 21.112713136898233 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame and Down Sampling | 14.4% | 530 | 21.599045498123022 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven | 16.5% | 503 | 18.271082139494112 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling | 15.5% | 553 | 18.940480585788073 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 3 Skip Frame | 12.5% | 556 | 25.031793392567 |
| Mobilenet SSD+ Deep SORT with 3 Skip Frame and Down Sampling | 11.5% | 541 | 25.69524476916254 |
| Mobilenet SSD+ Deep SORT with 3 Skip Frame and Probability Driven | 14.3% | 551 | 20.73637006639062 |
| Mobilenet SSD+ Deep SORT with 3 Skip Frame and Probability Driven and Down Sampling | 13.7% | 541 | 21.838736638293103 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame | 10.7% | 569 | 28.248501152598728 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame and Down Sampling | 9.5% | 577 | 28.92964870730287 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven | 13.2% | 552 | 22.9520797318525 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling | 12.1% | 567 | 24.037214225739753 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 5 Skip Frame | 9.0% | 607 | 30.847425214202232 |
| Mobilenet SSD+ Deep SORT with 5 Skip Frame and Down Sampling | 8.3% | 584 | 31.919496472324205 |
| Mobilenet SSD+ Deep SORT with 5 Skip Frame and Probability Driven | 11.7% | 624 | 25.052836061352583 |
| Mobilenet SSD+ Deep SORT with 5 Skip Frame and Probability Driven and Down Sampling | 11.1% | 571 | 26.00150446850327 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame | 7.7% | 634 | 32.77340066189756 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame and Down Sampling | 6.0% | 589 | 33.9516748754625 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven | 10.7% | 607 | 26.31595826272231 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling | 10.0% | 555 | 27.87592524453508 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 7 Skip Frame | 4.6% | 608 | 34.443203535459524 |
| Mobilenet SSD+ Deep SORT with 7 Skip Frame and Down Sampling | 3.5% | 618 | 35.8327512141732 |
| Mobilenet SSD+ Deep SORT with 7 Skip Frame and Probability Driven | 8.7% | 592 | 27.943382730046693 |
| Mobilenet SSD+ Deep SORT with 7 Skip Frame and Probability Driven and Down Sampling | 7.5% | 583 | 29.43941250448985 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 8 Skip Frame | 4.2% | 576 | 36.1859327760888 |
| Mobilenet SSD+ Deep SORT with 8 Skip Frame and Down Sampling | 2.8% | 538 | 37.96312668466682 |
| Mobilenet SSD+ Deep SORT with 8 Skip Frame and Probability Driven | 7.2% | 599 | 30.149078462256718 |
| Mobilenet SSD+ Deep SORT with 8 Skip Frame and Probability Driven and Down Sampling | 5.8% | 554 | 31.716512547097206 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 9 Skip Frame | 2.6% | 569 | 37.851134549878715 |
| Mobilenet SSD+ Deep SORT with 9 Skip Frame and Down Sampling | 1.6% | 566 | 39.18969878996756 |
| Mobilenet SSD+ Deep SORT with 9 Skip Frame and Probability Driven | 6.2% | 570 | 31.81984758148207 |
| Mobilenet SSD+ Deep SORT with 9 Skip Frame and Probability Driven and Down Sampling | 5.1% | 566 | 33.02867515902485 |
| … |  |  |  |
| Mobilenet SSD+ Deep SORT with 10 Skip Frame | 0.8% | 566 | 38.682324486214625 |
| Mobilenet SSD+ Deep SORT with 10 Skip Frame and Down Sampling | 0.0% | 529 | 40.239209547617996 |
| Mobilenet SSD+ Deep SORT with 10 Skip Frame and Probability Driven | 5.2% | 555 | 32.86656775948573 |
| Mobilenet SSD+ Deep SORT with 10 Skip Frame and Probability Driven and Down Sampling | 3.4% | 547 | 33.68070048767031 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Down Sampling** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Mobilenet SSD + Deep SORT | 19.0% | 577 | 9.8474409913098 |
| Mobilenet SSD+ Deep SORT with Down Sampling | 17.5% | 647 | 10.164599991702229 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame | 17.7% | 520 | 15.964183221155363 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame and Down Sampling | 16.6% | 569 | 16.252922740164827 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame | 15.7% | 494 | 20.658319625464184 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame and Down Sampling | 14.4% | 530 | 20.67430430123686 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame | 10.7% | 569 | 27.779953587538593 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame and Down Sampling | 9.5% | 577 | 28.811689015745316 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame | 7.7% | 586 | 32.62759230159879 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame and Down Sampling | 6.0% | 632 | 33.97791236616167 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Skipping Frame** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Mobilenet SSD + Deep SORT | 19.0% | 577 | 9.8474409913098 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame | 17.7% | 520 | 15.964183221155363 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame | 15.7% | 494 | 20.658319625464184 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame | 10.7% | 569 | 27.779953587538593 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame | 7.7% | 586 | 32.62759230159879 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Using probability Driven Detection** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Mobilenet SSD + Deep SORT | 19.0% | 577 | 9.8474409913098 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame | 17.7% | 520 | 15.964183221155363 |
| Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven | 18.0% | 523 | 14.404656840037314 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame | 15.7% | 494 | 20.658319625464184 |
| Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven | 16.5% | 503 | 17.894475042242103 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame | 10.7% | 569 | 27.779953587538593 |
| Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven | 13.2% | 552 | 22.686678543601083 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame | 7.7% | 586 | 32.62759230159879 |
| Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven | 10.7% | 558 | 26.286393126809276 |
|  |  |  |  |

# **Squeezenetv1.0 + Deep SORT**

|  |  |  |  |
| --- | --- | --- | --- |
| **FULL TABLE(Squeezenet\_1\_0 + Deep SORT)** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Squeezenet\_1\_0 + Deep SORT | 9.8%(9.9) | 484 | 21.44935625079553 |
| Squeezenet\_1\_0+ Deep SORT with Down Sampling | 9.4% | 433 | 21.673303061043992 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame | 9.3% | 470 | 34.95316996147481 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame and Down Sampling | 8.9% | 438 | 36.08590331121377 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame and Probability Driven | 9.4%(9.3) | 475 | 34.4817005552456 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling | 9.0% | 442 | 35.761214014786916 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame | 8.4% | 408 | 44.77171969416171 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame and Down Sampling | 8.2% | 372 | 46.824602862962315 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame and Probability Driven | 8.6% | 412 | 43.458595382243914 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling | 8.3% | 368 | 45.43947471585255 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 3 Skip Frame | 7.5% | 383 | 51.622355269656786 |
| Squeezenet\_1\_0+ Deep SORT with 3 Skip Frame and Down Sampling | 7.3% | 338 | 54.07041484165557 |
| Squeezenet\_1\_0+ Deep SORT with 3 Skip Frame and Probability Driven | 7.9% | 396 | 49.39042651822504 |
| Squeezenet\_1\_0+ Deep SORT with 3 Skip Frame and Probability Driven and Down Sampling | 7.6% | 349 | 52.12618978706074 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame | 6.8% | 328 | 56.87061749886791 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame and Down Sampling | 6.6%(6.5) | 301 | 60.00883585017237 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame and Probability Driven | 7.3% | 343 | 55.01059174306023 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling | 6.9% | 312 | 58.1498195028054 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 5 Skip Frame | 5.9% | 298 | 61.06823719084773 |
| Squeezenet\_1\_0+ Deep SORT with 5 Skip Frame and Down Sampling | 6.1% | 294 | 64.56221875850596 |
| Squeezenet\_1\_0+ Deep SORT with 5 Skip Frame and Probability Driven | 6.8% | 310 | 58.43487971342008 |
| Squeezenet\_1\_0+ Deep SORT with 5 Skip Frame and Probability Driven and Down Sampling | 6.5% | 301 | 62.216509837555506 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame | 5.6% | 301 | 64.21573734646725 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame and Down Sampling | 5.4% | 284 | 68.07149014549003 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame and Probability Driven | 6.1% | 313 | 62.483132411322366 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling | 6.0% | 297 | 65.81801238599576 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 7 Skip Frame | 4.4% | 281 | 66.78610024826153 |
| Squeezenet\_1\_0+ Deep SORT with 7 Skip Frame and Down Sampling | 4.4% | 275 | 70.8977870230824 |
| Squeezenet\_1\_0+ Deep SORT with 7 Skip Frame and Probability Driven | 4.9% | 313 | 64.7894798995347 |
| Squeezenet\_1\_0+ Deep SORT with 7 Skip Frame and Probability Driven and Down Sampling | 5.0% | 275 | 69.22877880309186 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 8 Skip Frame | 4.1% | 258 | 70.83954394395735 |
| Squeezenet\_1\_0+ Deep SORT with 8 Skip Frame and Down Sampling | 4.2% | 266 | 74.81412007335364 |
| Squeezenet\_1\_0+ Deep SORT with 8 Skip Frame and Probability Driven | 4.8% | 281 | 68.89956792262453 |
| Squeezenet\_1\_0+ Deep SORT with 8 Skip Frame and Probability Driven and Down Sampling | 4.8% | 283 | 72.8589426992236 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 9 Skip Frame | 3.8% | 278 | 73.28210769652618 |
| Squeezenet\_1\_0+ Deep SORT with 9 Skip Frame and Down Sampling | 3.8% | 268 | 76.56258851656787 |
| Squeezenet\_1\_0+ Deep SORT with 9 Skip Frame and Probability Driven | 4.3% | 285 | 72.09432757117155 |
| Squeezenet\_1\_0+ Deep SORT with 9 Skip Frame and Probability Driven and Down Sampling | 4.3% | 277 | 74.65828044339783 |
| … |  |  |  |
| Squeezenet\_1\_0+ Deep SORT with 10 Skip Frame | 3.5% | 236 | 78.29819637519171 |
| Squeezenet\_1\_0+ Deep SORT with 10 Skip Frame and Down Sampling | 3.1% | 232 | 79.04940471707698 |
| Squeezenet\_1\_0+ Deep SORT with 10 Skip Frame and Probability Driven | 4.0% | 246 | 72.6521545119922 |
| Squeezenet\_1\_0+ Deep SORT with 10 Skip Frame and Probability Driven and Down Sampling | 3.8% | 230 | 77.15925109834762 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Down Sampling** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Squeezenet\_1\_0 + Deep SORT | 9.9% | 484 | 20.042197668270926 |
| Squeezenet\_1\_0+ Deep SORT with Down Sampling | 9.4% | 433 | 20.717160451288965 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame | 9.3% | 470 | 33.892409156740605 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame and Down Sampling | 8.9% | 438 | 34.70319714140534 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame | 8.4% | 408 | 42.13578772760607 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame and Down Sampling | 8.2% | 372 | 43.91007535351279 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame | 6.8% | 328 | 53.7290647954817 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame and Down Sampling | 6.6% | 301 | 56.63252656732362 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame | 5.6% | 301 | 62.0070361055159 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame and Down Sampling | 5.4% | 284 | 63.02879991725403 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Skipping Frame** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Squeezenet\_1\_0 + Deep SORT | 9.9% | 484 | 20.042197668270926 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame | 9.3% | 470 | 33.892409156740605 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame | 8.4% | 408 | 42.13578772760607 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame | 6.8% | 328 | 53.7290647954817 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame | 5.6% | 301 | 62.0070361055159 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Tradeoff of Using probability Driven Detection** | | | |
| Algorithm | MOTA | IDsw | Average FPS |
| Vanilla Squeezenet\_1\_0 + Deep SORT | 9.9% | 484 | 20.042197668270926 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame | 9.3% | 470 | 33.892409156740605 |
| Squeezenet\_1\_0+ Deep SORT with 1 Skip Frame and Probability Driven | 9.4% | 475 | 32.83395018961477 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame | 8.4% | 408 | 42.13578772760607 |
| Squeezenet\_1\_0+ Deep SORT with 2 Skip Frame and Probability Driven | 8.6% | 412 | 40.69885878710128 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame | 6.8% | 328 | 53.7290647954817 |
| Squeezenet\_1\_0+ Deep SORT with 4 Skip Frame and Probability Driven | 7.3% | 343 | 49.940943534497414 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame | 5.6% | 301 | 62.0070361055159 |
| Squeezenet\_1\_0+ Deep SORT with 6 Skip Frame and Probability Driven | 6.1% | 313 | 58.15515176744455 |
|  |  |  |  |