# 计步器算法移植测试报告

**版本：1.0**

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## Changelog

|  |  |  |  |
| --- | --- | --- | --- |
| 版本号 | 变更人 | 变更说明 | 变更时间 |
| V1.0 | 张琛 | 初稿 | 2013/11/26 |

## 编写目的

将离线算法（python代码）移植为c/c++ 版在线算法，测试统计三个算法在快走、慢跑数据集上的误差。

## 测试环境

平台：PC，

操作系统：windows7 x64

编程语言：c/c++

## 测试结果

误差计算公式：

其中为数据文件i的groundtruth，为数据文件i的统计误差， 为数据集groundtruth和值。

表 1 数据集总体加权均值误差

|  |  |
| --- | --- |
| 算法 | 加权误差（%） |
| (th, f) 法 | 1.30% |
| dyPeak 法 | 3.47% |
| dyZcross 法 | 2.45% |

表 2 三种方法对各数据文件统计误差

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 数据文件 | groundtruth | (th, f)法 | err(%) | dyPeak 法 | err(%) | dyZcross 法 | err(%) |
| HY60fast\_a9\_0.xml | 60 | 60 | 0.00% | 62 | 3.33% | 62 | 3.33% |
| HY60fast\_a9\_1.xml | 60 | 60 | 0.00% | 60 | 0.00% | 61 | 1.67% |
| LH30fast\_a9\_3.xml | 30 | 33 | 10.00% | 34 | 13.33% | 32 | 6.67% |
| LH31fast\_a9\_0.xml | 31 | 31 | 0.00% | 34 | 9.68% | 32 | 3.23% |
| LH31fast\_a9\_1.xml | 31 | 30 | 3.23% | 35 | 12.90% | 32 | 3.23% |
| LH31fast\_a9\_2.xml | 31 | 31 | 0.00% | 33 | 6.45% | 33 | 6.45% |
| ZC30fast\_a9\_0.xml | 30 | 30 | 0.00% | 32 | 6.67% | 30 | 0.00% |
| ZC30fast\_a9\_1.xml | 30 | 30 | 0.00% | 31 | 3.33% | 33 | 10.00% |
| ZC30fast\_a9\_2.xml | 30 | 30 | 0.00% | 34 | 13.33% | 33 | 10.00% |
| ZC30fast\_a9\_3.xml | 30 | 30 | 0.00% | 28 | 6.67% | 30 | 0.00% |
| ZC30fast\_a9\_4.xml | 30 | 30 | 0.00% | 33 | 10.00% | 30 | 0.00% |
| ZC30fast\_a9\_5.xml | 30 | 30 | 0.00% | 35 | 16.67% | 31 | 3.33% |
| ZC30fast\_a9\_6.xml | 30 | 29 | 3.33% | 32 | 6.67% | 31 | 3.33% |
| ZC30fast\_a9\_7.xml | 30 | 30 | 0.00% | 31 | 3.33% | 32 | 6.67% |
| ZC30fast\_a9\_8.xml | 30 | 31 | 3.33% | 32 | 6.67% | 32 | 6.67% |
| ZC60fast\_a9\_0.xml | 60 | 60 | 0.00% | 60 | 0.00% | 64 | 6.67% |
| ZC60fast\_a9\_1.xml | 60 | 59 | 1.67% | 61 | 1.67% | 61 | 1.67% |
| ZC60fast\_a9\_2.xml | 60 | 60 | 0.00% | 62 | 3.33% | 64 | 6.67% |
| ZC60fast\_a9\_3.xml | 60 | 60 | 0.00% | 62 | 3.33% | 61 | 1.67% |
| ZC60fast\_a9\_4.xml | 60 | 60 | 0.00% | 62 | 3.33% | 63 | 5.00% |
| ZCrun120\_a5\_0.xml | 120 | 122 | 1.67% | 119 | 0.83% | 126 | 5.00% |
| ZCrun120\_a9\_3.xml | 120 | 122 | 1.67% | 125 | 4.17% | 124 | 3.33% |
| ZCrun120\_a9\_4.xml | 120 | 122 | 1.67% | 120 | 0.00% | 122 | 1.67% |
| ZCrun120\_a9\_5.xml | 120 | 121 | 0.83% | 117 | 2.50% | 121 | 0.83% |
| ZCrun120\_a9\_6.xml | 120 | 122 | 1.67% | 120 | 0.00% | 122 | 1.67% |
| ZCrun120\_a9\_7.xml | 120 | 121 | 0.83% | 123 | 2.50% | 123 | 2.50% |
| ZCrun120\_a9\_8.xml | 120 | 121 | 0.83% | 118 | 1.67% | 121 | 0.83% |
| ZCrun402\_a9\_2.xml | 402 | 405 | 0.75% | 388 | 3.48% | 404 | 0.50% |
| ZCrun480\_a9\_10.xml | 480 | 468 | 2.50% | 464 | 3.33% | 473 | 1.46% |

## 结果分析

1. 由表1看出，三种方法在“快走+慢跑”数据集上误差都比较小；其中，（th, f）法误差均值最小；
2. 由表2看出，对于单个文件，（th, f）法未必恰好是最准确的；但此方法的额外优点是，计步器每次只增加一步，移植到android上时，UI可以每计一步，“心跳”一下。而另外两个方法每次可能计多步（2~3步），UI上呈现不如前者美观；