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Before Code Ocean

1. Find the code
2. Acquire the right hardware
3. Set up the environment
4. Import the right files
5. Installing all dependencies...packages, versions, OS etc...
6. Errors.. Debugging.. Errors.. Debugging
7. Run
8. Results
After Code Ocean

Steps 1 to 6 are already configured, just press

Run

And see the results!

1. Find the code ✓
2. Acquire the right hardware ✓
3. Set up the environment ✓
4. Import the right files ✓
5. Installing all dependencies ✓
6. Errors.. Debugging.. Errors.. Debugging ✓
Exploring Causal Relationships in Visual Object Tracking

```python
# Script to query a pre-trained gaussian process. Outputting the expected radius for a set of normalised points on the objects surface.

command line args:
- i input file path
- o output file path
- d num_dimensions
- n num_pts
- v verbose

return codes:
  0 success
  1 invalid csv file dimensionality
  2 File IO failure

Created on Jun 17, 2013

Author: Simon

```

Example workspace.mat (261.04 KB)
**IS THERE A REPRODUCIBILITY CRISIS?**

- 52% Yes, a significant crisis
- 38% Yes, a slight crisis
- 7% Don't know
- 3% No, there is no crisis

1,576 researchers surveyed

**HAVE YOU FAILED TO REPRODUCE AN EXPERIMENT?**

Most scientists have experienced failure to reproduce results.

- Chemistry
- Biology
- Physics and engineering
- Medicine
- Earth and environment
- Other

Nature 533, 452–454 (26 May 2016) doi:10.1038/533452a
Improving user experience
A reanalysis of mouse ENCODE comparative gene expression data [version 1; referees: 3 approved, 1 approved with reservations]

Yoav Gilad, Orra Mizrahi-Man

This article is included in the Preclinical Reproducibility and Robustness gateway

Abstract

Recently, the Mouse ENCODE Consortium reported that comparative gene expression data from human and mouse tend to cluster more by species rather than by tissue. This observation was surprising, as it contradicted much of the comparative gene regulatory data collected previously, as well as the common notion that major developmental pathways are highly conserved across a wide range of species, in particular across mammals. Here we show that the Mouse ENCODE gene expression data were collected using a flawed study design, which confounded sequencing batch (namely, the assignment of samples to sequencing flowcells and lanes) with species. When we account for the batch effect, the corrected comparative gene expression data from human and mouse tend to cluster by tissue, not by species.

Corresponding author: Yoav Gilad
Validation of functional calibration and strap-down joint drift correction for computing 3D joint angles of knee, hip, and trunk in alpine skiing

Benedikt Fasel, Jörg Spörri, Pascal Schütz, Silvio Lorenzetti, Kamiar Amirian

Published: July 26, 2017 • https://doi.org/10.1371/journal.pone.0181446

Abstract

To obtain valid 3D joint angles with inertial sensors careful sensor-to-segment calibration (i.e. functional or anatomical calibration) is required and measured angular velocity at each sensor
Conclusion

An optimized functional calibration movement was proposed and validated. The wearable system was able to estimate the 3D joint angles for hip and trunk, as well as the knee flexion angle. The knee adduction/abduction and internal/external rotation should be interpreted with care as the estimated angles may include axis-cross talk and soft tissue artefacts. The accuracy might not be sufficient for absolute angle comparisons across different athletes. However, the system should be sufficiently sensitive for within-athlete comparisons assessing the influence of certain conditions or interventions on joint kinematics. Further investigation should be targeted on reducing soft tissue artefacts of the thigh. In the context of coaching, the system could be used to provide athletes precise and objective feedbacks on their movement patterns and to improve their techniques. Moreover, knowing the joint ranges of motion and joint movement speeds, strength and conditioning trainings could be optimized and personalized.
Functional calibration for trunk and lower limb fixed inertial sensors

Benedikt Fasel (1), Jörg Spörri (2,3), Josef Kröll (3), Kamiar Aminian (1)

1) Laboratory of Movement Analysis and Measurement, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland. 2) Department of Orthopaedics, Balgrist University Hospital, University of Zurich, Switzerland. 3) Department of Sport Science and Kinesiology, University of Salzburg, Austria

Jul 12, 2017

DOI:10.17504/protocols.io.troem6

Steps

1. Squats with rolling spine

   Slow squats with knee, hip, trunk, head flexion. Arms are parallel to the leg. Perform the flexion movements until the fingers reach the ankles. Perform the movement three times.

   Squats front view
Inertial Sensor Functional Calibration

Here you can find the code to functionally align inertial sensors to their respective segments. The set of calibration movements to perform along with illustrative videos can be found under the DOI 10.17504/protocols.io.itrcem6. The functional calibration has been further described and validated in the article Fasel B, Sporri J, Schütz P, Lorenzetti S, & Aminian K (2017). Validation of functional calibration and strap-down joint drift correction for computing 3D joint angles of knee, hip, and trunk in alpine skiing. PLOS ONE, DOI 10.1371/journal.pone.0181446.

Note that the calibration movements have been initially proposed for in-field motion capture of alpine ski racing. However, the functional calibration can also be applied to any other domain as long as the person is able to well perform the required calibration movements.

Structure

Data

The inertial data of all sensors is stored in /data/imuData.mat. The data is already synchronized and accelerometer offset and sensitivity and gyroscope offset have been
Why is it important?

**Reproducibility**
Code Ocean allows other researchers to run the code, to test for reproducible results, and also execute the code with new input values.

**Impact**
There is a positive correlation between the availability of code and software and the number of citations.

**Reuse**
Allows users to run multiple versions of the algorithm augmenting the code or/and using alternative inputs.

**Move beyond the pdf**
Brings authors work alive in an executable environment and provides a new level of engagement to end users.
Thank you for your time

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