Validation protocol: uniform measurement of the same object

aPrehliadky (iPhone) and Fotograme3ka 3D (Mac) · version 2 (reference dimensions by caliper) · for collaborating forensic medicine departments

Aim

At every department, capture the same type of object with known dimensions by the same procedure and compare what the app measures with reality (ruler, caliper). From the results of all departments we determine the real accuracy and repeatability of measurement and fix what does not agree. One session takes about 30 minutes. This is a validation procedure, not an examination procedure: at a real body no caliper is used; there the T3 target applies, otherwise a known dimension in the scene (ISO card, A4 sheet, rule), otherwise the LiDAR scale (user guide, ch. 10.2).

Rule: never any persons, faces, names, case files or case data in the frame. Packages will be shared between departments and may be used in the methodology and in publications.

What you need

- An iPhone Pro with LiDAR (iPhone 12 Pro or newer) with aPrehliadky 3.2.6 or newer (About → version number). Set the app to English in iOS Settings → aPrehliadky → Language if you prefer.
- If available: a Mac with Apple Silicon and Fotograme3ka 3D 2.1.4 or newer (full model from all frames).
- Object: a waste bin with a label on the lid (as in the ÚDZS) or another rigid object of 30–60 cm with sharp edges; tell us which. Neither the label nor any other feature of the object is a reference with a prescribed size: you measure the real dimensions yourself (step 1).
- T3.1 calibration target from the app (scan list → menu … → Target T3), printed at 100 % scale on matte paper and glued to a rigid board. Laminate only with a matte film. The target is the only physical verification of the scale (class A).
- A caliper (required; the target A–B of 247 mm needs a 0–300 mm range, 150 mm is not enough, a steel ruler is the alternative) and a tape measure.

1. Preparation (5 min)

1. With a caliper, measure the distance between the centres of circles A–B on the target (should be 247.00 mm). Write it down.
2. With a caliper (not a ruler, not from memory or a catalogue), measure 5 reference dimensions of the object and write them into the table (page 2) before scanning: label long and short side (the whole white label, not the printed frame), bin height, bin width (longest horizontal edge), lid diagonal or another well-defined edge. At least one dimension should be ≥ 290 mm.
3. Place the object on a matte surface in even light without flash and not in direct sunlight (outdoors in the sun the LiDAR measured 5 % differently). Lay the target flat next to the object (not on it).

2. Capture: three scans of the same object (10 min)

Scan	T3 target	Scan name (Case field)	Purpose
A	yes	VAL-DEPT-bin-A	main scan: scale from the target, from LiDAR depth and from the camera path
B	no (move out of frame)	VAL-DEPT-bin-B	what LiDAR (depth) and the camera path give without a target
C	yes	VAL-DEPT-bin-C	repeat of A: repeatability

- New scan settings: profile Object / item, extent Overview; replace DEPT with your department code.
- Walk slowly around the object at three heights (low, level, high), distance 0.5–1 m, about 1 minute. In scans A and C pass directly over the target at least once from 0.5–0.8 m (the “target” counter must increase).
- Finish with Finish capture and let the processing complete (phone on a charger, screen on).

3. Measuring in the app (10 min per scan)

1. Open the model, tool Measure → Distance. Before each point zoom in so the edge fills a large part of the screen, and fine-tune the point with the loupe (not “with a finger from afar”).
2. Measure all 5 reference dimensions without a reference, save each measurement named after the dimension (e.g. “label length”). Write down the value and the uncertainty ±U shown by the app, and the documentation class from the model header.

3. Only then enter the Reference: the longest of the dimensions you measured with the caliper in step 1 (ideally ≥ 290 mm), and enter your measured value, not a nominal one or an estimate (Reference button, points exactly on the edges, with Fine-tune). Write down which dimension it was and whether the app reports “Reference agrees” or “Reference DOES NOT MATCH” and the deviation in %.
4. If you have a Mac: open the package in Fotograme3ka 3D, recompute (Forensic preset) and measure the same 5 dimensions again.

4. How to send it to me

1. For each scan: Export → For the case file → “Model, findings and frames” → Create .f3d package (0.3–1 GB). Also Export → Other outputs → Validation CSV (a small file with scale, quality and measurements).
2. Name the files after the scan (e.g. VAL-NR-bin-A.f3d, VAL-NR-bin-A.csv) and add the completed table from page 2 (photograph the paper or type it into the e-mail).
3. Upload to your department's shared folder (OneDrive, Google Drive, iCloud) and send the link to admin@forensika.eu with the subject “aPrehliadky validation – DEPT”. When meeting in person, AirDrop is enough.

What we will learn: whether the scale without a reference (from the target, from LiDAR depth, from the camera path) agrees with reality, whether the target gives class A, how much repeated scans and iPhone versus Mac differ. All departments will receive the results back as a summary table. Change from v1: reference dimensions by caliper only and no prescribed label size (the nominal 75 mm turned out to be wrong). The current version is at dzanino.github.io/aPrehliadky.

Recording table (one per department)

In the scan column write the value from the app and its uncertainty, e.g. “69.8 ± 1.2”. Reality = caliper (step 1), written down before the scan.

Item	Reality	Scan A	Scan B	Scan C	Mac (if any)
Department, name, date					
iPhone (model), aPrehliadky version					
Target A–B (caliper)	247.00 mm				
Documentation class (A–D)					
Number of frames / target found (yes/no)					
1 label long side (mm, ±U)					
2 label height (mm, ±U)					
3 bin height (mm, ±U)					
4 bin width (mm, ±U)					
5 other dimension: ..... (mm, ±U)					
Reference (dimension no. …, value from step 1): agrees / does not match, deviation %					
Notes (light, problems, capture time)					

Contact and questions: Ján Šikuta, MD, PhD · admin@forensika.eu · app guides: dzanino.github.io/aPrehliadky