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Gait assessment in a canine model of XLMTM using an instrumented carpet

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Author	Melissa A Goddard
	University of Washington
Working group members	Martin K Childers, David L Mack
	University of Washington
SOP responsible	Melissa A Goddard
Official reviewer	Martin K Childers

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1. OBJECTIVE

Dogs are walked at a self-selected pace along a specially instrumented carpet that captures and quantifies the characteristics of each footfall. The aim is to collect 8-10 consistent walks to measure spatiotemporal parameters such gait velocity, stride length and paw pressure.

2. SCOPE AND APPLICABILITY

Gait assessment was developed as way to quantitatively analyse changes caused by disease or clinical intervention in human patients. The method has been used in a similar fashion in canine models of neuromuscular disorders.

3. CAUTIONS

The electronic walkway should be set up on dry flooring and should be unplugged before cleaning. Walkway should never be folded or creased and should be dry before storage on its drum. When setting up the instrumented walkway, tuck cords away to prevent tripping or chewing.

4. MATERIALS

- GAITRite Electronic Walkway and peripherals (CIR Systems Inc)
  - Instrumented carpet, Interface Cable box (including AC adaptor), web camera
- Laptop computer with GAITFour software (version 4, CIR Systems Inc)
- Paper towels
- Dog treats
- Toys
- Leash
- Water and water bowl
- Wall outlets
- Extension cords
- Tripod

5. METHODS

Equipment Set Up
- Carefully unroll instrumented walkway on to designated floor space
- Turn on laptop
- Connect USB plug of interface box to laptop USB port
- Connect fire-wire cable of interface box to carpet
- Connect AC adaptor and plug in to wall outlet
- Place web camera on tripod and connect to laptop via USB port
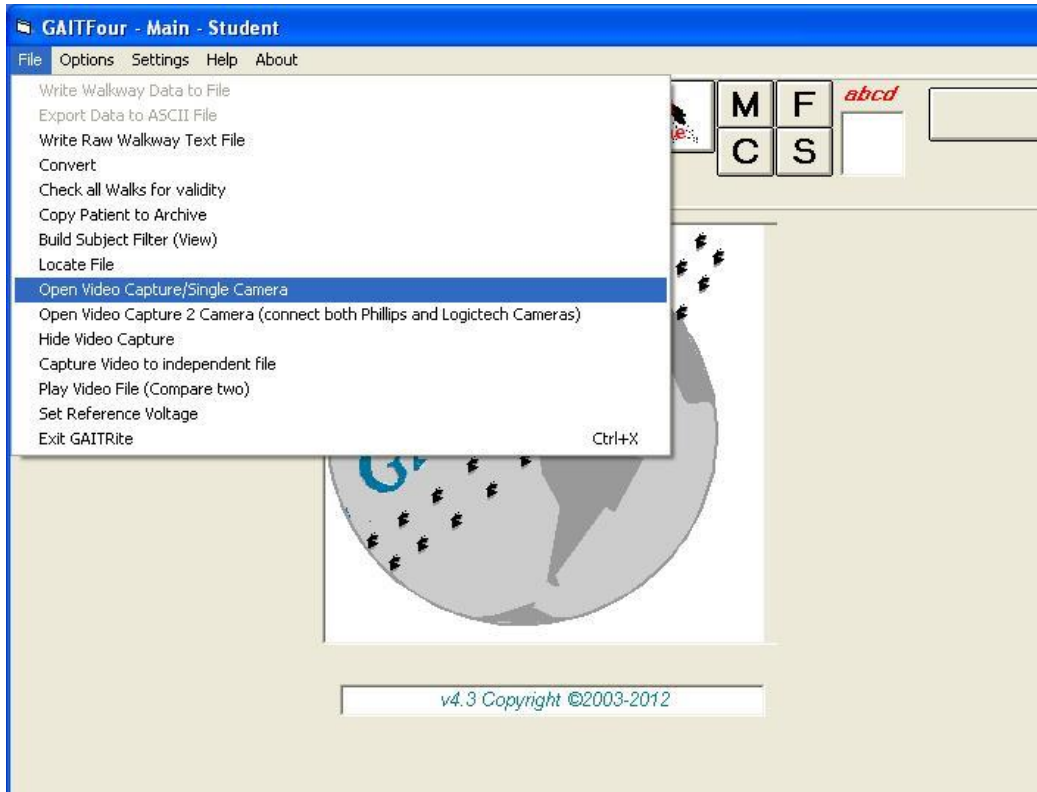
Software Set Up
- Load GAITFour software by double clicking the icon
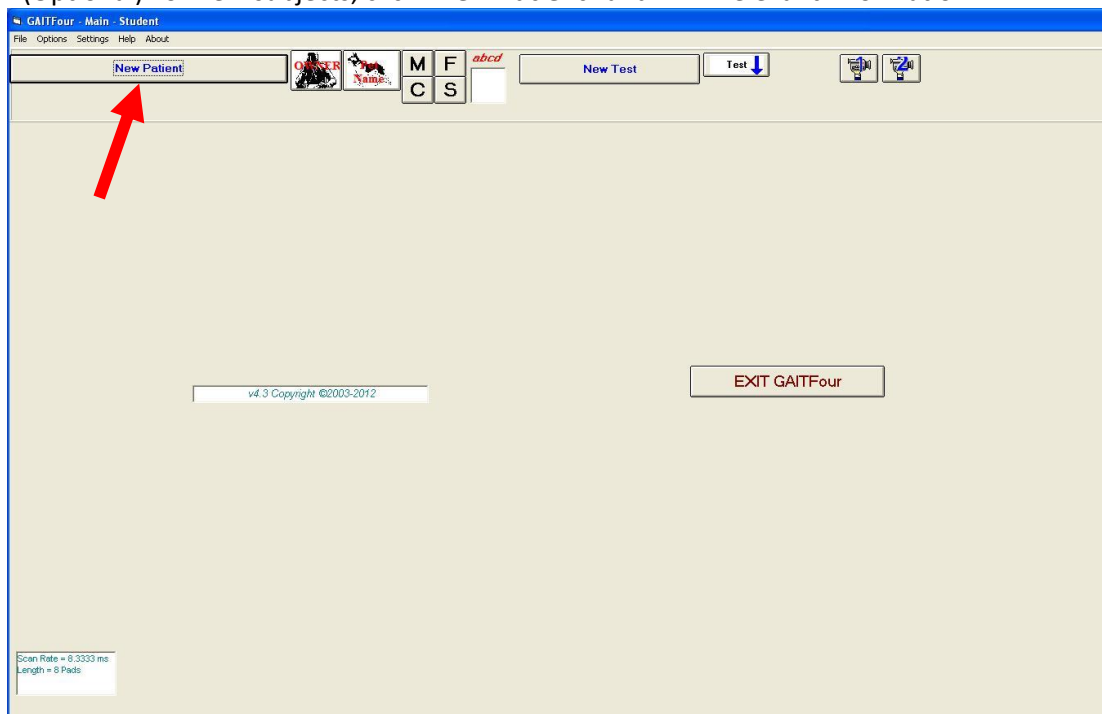- Once loaded, triple clicking the User ID prompt box to run the program
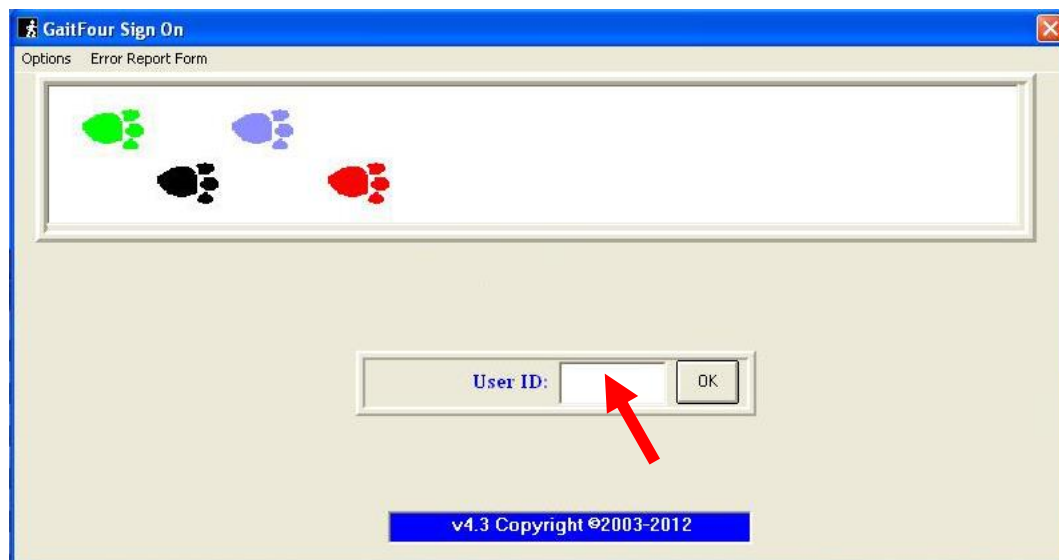
- Asterisks (*******) will appear if this is done correctly

- Click "**File**" and select "**Open Video Capture/Single Camera**" to load web camera

- (Optional) For new subjects, click "**New Patient**" and fill in relevant information

The name, age and gender slots must be completed before "**OK**" will be accepted

- Click "**Pet Name**" and select subject from dropdown.
- Click "**New Test**"

(Optional) Acclamation
- Dogs that are naïve to the instrumented walkway should be allowed to sit on, walk along and explore it before beginning the test.

Walking the dog
- Leash dog and walk near to the one end of the walkway, ensuring that the dog remains off carpet
  - Alternately, for dogs that are not leash trained or that have difficulty walking on leash, handlers can sit at opposite ends of the carpet and call the dog back and forth
- Click **"Begin Test"**
- When prompted by the software operator that the test has begun running, have the dog walk on to the carpet and completely off the other end at its own pace
  - Treats and toys can also be used to encourage the dog
- Click **"End"** if test does not stop running automatically and reward the dog with treats or attention if walk is as desired

Data storage
- Click **"Cancel"**
  - The **"Memo"** button can be used to make notes (e.g., "good walk" or "trot" or to clear notes from a previous test)
- Click **"Suspend"** to suspend walk for processing later
- Collect 10-15 walks considered good, if possible. However, stop test immediately if dog shows signs of tiring (e.g., panting, rapid breathing or heart rate, or difficulty walking or standing)
  - "Good" walks should be mostly in a straight line on the carpet and at a consistent pace. Walks are preferable to trots or runs.

6. EVALUATION AND INTERPRETATION OF RESULTS

GaitFour software automatically calculates spatiotemporal parameters can also be used to generate summary reports.

7. REFERENCES

GAITRite electronic walkway technical reference. *Cir systems inc.* WI-02-152011.

Light VA, Steiss JE, Montgomery RD, Rumph PF, Wright JC. Temporal-spatial gait analysis by use of a portable walkway system in healthy Labrador Retrievers at a walk. *Am J Vet Res*. 2010;71(9):997-1002