



Revolutionizing  
Behavior Research



# RunwayScan

## Features:

- Complete Gait Analysis software for Walkways
- Software tool applicable on any walkway providing clear ventral view
- Captures digital video at high-speed (100 frames per second or more)
- Provides over 52 Distinct Measures of Gait!
- Exports conveniently to Excel, formatted for input into Stats packages
- Lists all samples collected per animal and their simple statistics
- Statistics can be exported across Groups of animals
- Automatic Graphing of Gait Patterns included in Export
- Software is trainable to adapt to changing environment
- Result review, Visualization of Acquired Experiments
- Extensive Experiment Database Management included!
- Batch-mode allows user to run multiple videos successively without human intervention
- Validated with Columbus Instruments' ExerGait treadmill

## Measures RunwayScan can provide:

- |                     |                           |
|---------------------|---------------------------|
| • Stride Time       | • Coupling Measures       |
| • Stance & Swing    | • Print Length            |
| • Stride Length     | • Toe Spread              |
| • Print Area        | • Intermediary Toe Spread |
| • Body-Foot Spacing | • Print Angle             |
| • Foot-Foot Spacing | • Gait Angle              |
| • Running Speed     | • Body Rotation           |
| • Distance Walked   | • Body Shift              |
| • Stance Graph      | • Stride Frequency        |

RunwayScan is a component of our *NeurodegenScan Suite*. RunwayScan system meets the needs for gait analysis of animals. Gait analysis allows highly sensitive, noninvasive detection and evaluation of many pathophysiological conditions, such as those occurring in Spinal Cord Injury, Parkinson's disease, Alzheimer's disease, ALS, arthritis, pain, neuromuscular and skeletal muscle diseases.



RunwayScan system takes video of animal (mouse or rat) walking on a clear walkway, as input. The video of the ventral view (underside view) of the animal is obtained using one or more high-speed digital cameras. The video essentially captures the foot prints of the animal as they walk/run on the walkway. RunwayScan can work with videos taken from any walkway that allows the capture of its footprints on any video capturing hardware system with a high-speed camera.

RunwayScan can reliably analyze the video, and determine various characteristic parameters that are related to the pathophysiological conditions. These parameters include the stance time (paw on the belt), the swing time (paw in the air), total stride time, stride length, foot contact area size (also representative of foot pressure), body-foot spacing distance (distances between body and feet), foot spacing distances (distance between various feet), running speed, stride frequencies, foot coupling measures (in-phase or out-of-phase gait patterns of feet), and Sciatic Function Index related measures such as foot print placement rotation angle with body and toe spread factors (splay). Also calculated are brake time (early part of stance until the paw reaches maximum contact) and propel time (latter portion of stance when the paw is propelling the body). RunwayScan also provides Whole Body Movement Information, including information about Body Rotation during walking, Body Shifting (lateral and longitudinal whole body movements) during walking. Base of support information including a new measure called Gait Angle is also provided.



## RunwayScan

(Continued from front)

### Applications:

- Spinal Cord Injury
- Parkinson's Disease
- Alzheimer's Disease
- ALS
- Arthritis
- Pain
- Neuromuscular diseases
- Skeletal muscle diseases
- Ataxia

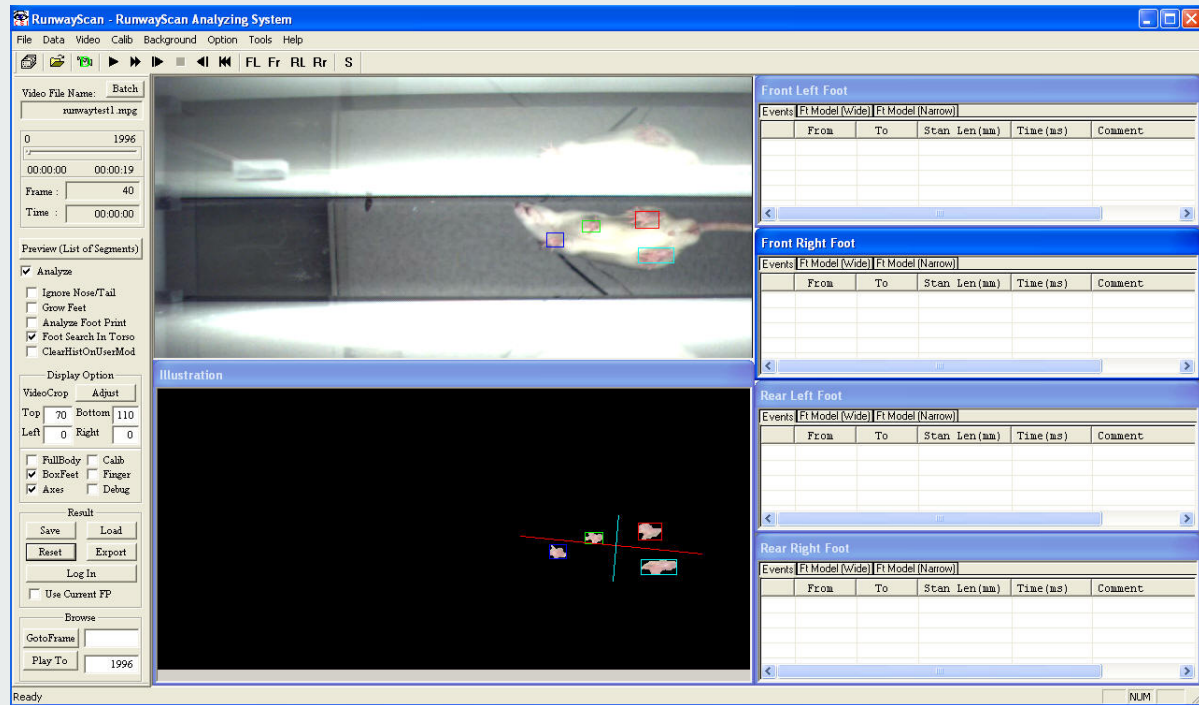
### Results:

- Objective Gait Analysis Results
- Ability to Review collected strides before exporting
- Automatic highlighting of sample outliers for error detection and correction
- Automatic Export to MS Excel
- Complete Experiment Database Management
- Full-list of all samples collected per animal, as well as, summary data for each set of measures output clearly to a separate sheet in an Excel file.
- Group Export available that allows multiple animals' data to be exported to a single Excel sheet allowing easy Group or sub-group analysis

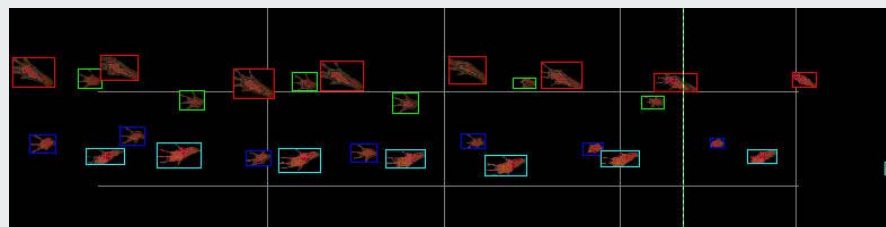
### Requirements:

- Windows-based PC
- Intel available high-speed Processor
- 2 GB RAM
- High-speed area scan digital camera
- Large HDD space for storing video data
- Good overhead lighting conditions

RunwayScan outputs the detailed results of these parameters from analysis into Microsoft Excel files and gives statistical results to meet requirements in the research. Advanced functionalities such as batch mode analysis, group export, direct analysis of AVI captured files, and post-hoc conversion to compressed MPEG videos to save disk-space are available. A sample screenshot of the RunwayScan software is shown below. The stride data is shown on the right for each foot individually. The results are updated as the analysis takes place.



The latest version of RunwayScan now includes two new features – a) Ability to automatically detect outliers in the results so that you can review the questionable results more efficiently, and b) ability to view and export the Ink-Pad like image that shows the placement positions of the various feet.



### Unique Capabilities:

- Complete Software Solution
- Analyzes 640x480 at 100 frames per sec
- Detects feet in animals with almost similar coat color like Agouti and White mice!
- Works with rodents of all colors/sizes
- Stores video in MPEG with high-compression for optimal use of disk space
- Provides a Comprehensive set of gait measures
- Export Stance Graph (a timing diagram of the foot stances and the foot contact size information) and the Ink-Pad image showing the foot placement positions
- Ability to automatically flag outliers for further review