ProAnalyst® Fundamental Skills

An Xcitex Professional Development Training Course

ProAnalyst Fundamental skills is a two-day course that provides comprehensive training to the beginning or occasional user, guided by Xcitex's own motion analysis experts. Live demonstrations and hands-on exercises will expose students to realistic problem-solving techniques from a cross-section of application areas.

The course material focuses on the fundamental features of ProAnalyst and techniques for automatically tracking movement. Prior working knowledge of ProAnalyst is beneficial, but not required.

Topics include:

- The fundamental steps of motion analysis
- The ProAnalyst interface and working environment
- Auto-tracking and picking the best template
- Graphing results and filtering graphical data
- The various types of motion analysis and feature tracking available in ProAnalyst

Course participants will be awarded a certificate of completion and be provided with classroom notes. Attendees should try to bring their own laptop computers and example files. Xcitex engineers will be on-hand throughout the course to discuss specific applications and requests from participants. Some time has been set-aside at the end of each day to discuss applications.

Course Syllabus

Day 1

The Fundamental Steps of Motion Analysis	Most analysis of movement requires simple steps from the operator: scene calibration, image processing and filtering, object tracking and data reduction. The participants will be walked through a variety of motion analysis examples and taught how to effectively implement each of the steps for the associated environment. Topics include: • Simple scalar calibration • Applying image processing and filtering • Determining which tracking tools are best • Creating illustrative graphs within ProAnalyst • Exporting data to other graphing programs
Introduction to the ProAnalyst Working Environment	The participants will be given an overview of ProAnalyst's basic user interactivity paradigm, including navigation of the ProAnalyst workspace, creating projects, timelines, workspace view, measurement window, and file management.

Introduction to Image Processing and Filtering	In this section, participants will be introduced, with very little mathematics, to the numerous image processing filters and features available within ProAnalyst for image manipulation, sharpening and color management. The instructors will provide tips and insight into proper filter selection for edge sharpening and background removal, for example, and how to combine numerous filters to highlight features for better tracking. Participants will be taught how to compensate for lens distortion and how to create time-lapse strobe effect images.
Scene Calibration Techniques	This section explains the powerful image calibration techniques contained within ProAnalyst, including multi-plane calibration, perspective (4-point) calibration and planar calibration. Also covered will be an explanation of coordinate system management and removing camera tilt.
Auto-Tracking of Objects using the 2-D Tools	ProAnalyst's centerpiece functionality is automatic feature tracking. Participants will learn how the essential steps to tracking multiple features within a single video. Topics include: • Joining tracked features with lines to create stick-figures • Adding distances and angles to the tracked • Correcting spurious data points • Tracking through an obscuration • Tracking rotating objects The various settings of the ProAnalyst 2D feature tracking toolkit will be demonstrated with real-world examples.

Day 2

Tracking Edges Using the Line Tracking Toolkit	This section will explore the nuances of ProAnalyst's industry-unique 1-dimensional Line Tracking toolkit. The 1-D Line Tracking is ideal for extracting and analyzing the motion of objects without well-defined features, such as a balloon or vibration dampers or some ballistics and gels. Participants will learn to track using the derivative and intensity values, compute circle fits, and use the 1D tracking alongside the 2D feature tracking in the same video.
Data Reduction and Data Analysis	This section provides a general overview of the various methods employed by ProAnalyst to reduce motion to quantified graphs and data. The goal of this section is to educate the user as to the power of ProAnalyst for generating quick, comprehensive data. Topics include: • On-screen ProAnalyst graphing capabilities • X-Y-Z tri-axial graphing to correlate complex motions from different views

	• Data filtering and post processing • Exporting data to other mathematical programs such as MATLAB for further analysis • Exporting data to custom Excel templates. • Creating Powerpoint presentations • Creating web pages directly from ProAnalyst • Collaborating with others.
The ProAnalyst Optional Toolkits	The participants will learn how to implement the optional toolkits in ProAnalyst for tracing and quantifying contours of blob objects, for counting and sorting particles and other objects within a video and for stabilizing videos to remove unwanted motion from hand jitter or vibration. Students will also be given a working demonstration of ProAnalyst 3-D Professional Edition to understand how to use the 3-D manager for bringing together images from two video cameras.
Synchronizing video with external data	In this section, participants will be instructed how to synchronize video motion with data acquired from external sensors and DAQ devices. ProAnalyst allows users to import data from most major data suppliers and to align that data with videos for a unique fusion of data. Using this feature, participants will learn how to superimpose movement analysis with sensor data.

Course Length: 2 days

Cost: $1500

Class Size: Maximum of 20 participants and minimum of 6 participants

Please e-mail info@xcitex.com or call 617-225-0080 to register for this course. Registration deadline is May 15, 2015.