Force Platforms in Biomechanics

Types of Force Platforms

Single Pedestal (Winter, 1991)
- inexpensive
- inaccurate at the edges

Three or Four Pedestal (Nigg and Herzog, 1996)
- expensive
- accurate within the area of the pedestals

Strain gauge (AMTI, Ariel, Bertek)
- inexpensive
- low frequency response
- no drift, therefore better for posture and balance
- needs regular balancing
- limited range

Piezoelectric (Kistler)
- expensive
- high frequency response, therefore better for impacts
- drift must be compensated electronically
- wide range of sensitivities are possible

Hall-effect (some AMTI models)
- inexpensive
- compact for portability
- low natural frequency (150 Hz)
- wide range of sensitivities
- no drift

Demonstrations:

1. Real-time force histories
   - using storage oscilloscope or real-time A/D

2. Centre of pressure test—X-Y oscilloscopy
   - using oscilloscope in X-Y mode or BioWare or BioProc2/3

3. Simultaneous EMG and force platform recording
   - using BioAD, SIMI or Vicon

4. Importing and processing data with BioProc2/3 or Visual3D
   - double-integration for centre of gravity

5. Force signatures and centre of pressure paths
   - using Visual3D or Polygon

6. Fourier analysis and reconstruction of force signals
   - using BioProc2/3

7. Force platform normalization (amplitude and time base)
   - using BioProc2/3, Excel