

# NEURAL ENGINEERING RESEARCH LAB

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## FACILITIES @CENTER FOR BIOMEDICAL ENGINEERING

### COMPUTATIONAL NEUROSCIENCE LAB (ROOM D-205, 20M<sup>2</sup>)

- 1x Dell Precision 3620 (Xeon E3-1270, 256GB SSD, 2TB HDD, 32GB RAM, Quadro K620)
- 1x Dell Precision 3630 (Xeon E-2246G, 256GB SSD, 2TB HDD, 32GB RAM, Quadro P400)
- 2x Dell XPS 8700 (i7-4790, 1TB HDD, 16GB RAM, GeForce GTX 745)
- 1x Dell Optiplex 7050 (i7-7700, 256GB SSD, 1TB HDD, 16GB RAM, RADEON R5-430)
- 1x Dell Optiplex 7070 (i7-9700, 256GB SSD, 1TB HDD, 16GB RAM, RADEON R5-430)
- 1x Dell Optiplex 3020 (i5-4590, 128GB SSD, 8GB RAM, Intel Graphics)
- 1x Samsung SL-M2885FW All-in-One Printer

*Major Software: MatLab, Python Ecosystem, R, NEURON Simulator, NetPyNE, JAVA SDK, Eclipse IDE*

### NEUROPHYSIOLOGY & MOTOR CONTROL LAB (ROOM A-102, 17M<sup>2</sup>)

- 1x Dell Precision 3630 (Xeon E-2246G, 256GB SSD, 2TB HDD, 16GB RAM, Quadro P400)
- 1x Dell Optiplex 7050 (i7-7700, 256GB SSD, 1TB HDD, 16GB RAM, RADEON R5-430)
- 1x Dell Inspiron 14 7460 (i7-7500U, 128GB SSD, 1TB HDD, 16GB RAM, GeForce 940MX)
- 1x OT Bioelettronica Quattrocento (96-channel HD EMG, 8x bipolar amplifiers, 1x 64ch mono/bipolar amplifier)
- 1x Delsys Trigno Hand Performance Monitor (HPM, including: 1x Trigno Duo Sensor, 1x Trigno Charge Station, 1x JAMAR hand dynamometer, 1x Samsung S5e tablet)
- 1x Custom-made EMG amplifier (4-channel bipolar EMG for surface and fine-wire recordings)
- 1x Biopac STIMSOLA (isolated constant current/voltage linear stimulator)
- 1x MTS Miniature Shaker K2007E01 (with amplifier and BNC connector)
- Several Precision Microdrives Linear Resonant Actuators (with a single driver circuit)
- 1x Transtec N320 2kN Uniaxial Load Cell
- 1x ATI Mini-40 Multiaxis Force Transducer (with amplifier)
- Several Tekscan Flexiforce Piezoresistive Sensors
- 2x Flexiforce Sensor Amplifier
- 1x AD Instrument PowerLab 4SP (4x analog inputs and 2x analog outputs)
- 1x AD Instrument Bridge Amp (4-channel load cell amplifier)
- 1x NI DAQ USB-6002 (8x analog inputs, 16bit, 50kS/s/channel, 2x analog outputs, 5kS/s/channel, 13x digital io, custom-made box with BNC connectors)
- 1x NI DAQ USB-6341 (16x analog inputs, 16bit, 500kS/s/channel, 2x analog outputs, 900kS/s/channel, 24x digital io)
- 1x NI DAQ USB-6212 (8x analog inputs, BNC connectors, 16bit, 400kS/s/channel, 2x analog outputs, BNC connectors, 250kS/s/channel, 24x digital io)
- 1x Keysight DSOX1204G Oscilloscope (4x analog inputs, 70MHz sampling rate, 1x waveform generator)
- 1x Fluke 117 Digital Multimeter

- 1x Autoclave ECO Stermax 7L
  - 1x Custom-made mechanical apparatus for recording isometric index finger abduction
  - 1x Custom-made mechanical apparatus for recording isometric index finger abduction/flexion
  - 1x Custom-made mechanical apparatus for recording isometric incisal bite force (function of masticatory muscles)
  - Several AM-System electrodes, including Ag/AgCl 4mm cup electrodes and PFA-coated stainless steel fine wires
  - Several OT Bioelettronica HD EMG grids (64 electrodes)
  - Several stimulation electrodes, including self-adhesive pads and ring electrodes
- Major Software: MatLab, Labview, OT Biolab+, AD Instruments Chart 5.x, Delsys EMGWorks, Delsys Mobile Software (for Android)*

## NEUROMECHANICS & NEUROREHABILITATION LAB (ROOM A-108, 27M<sup>2</sup>)

- 1x Dell Precision 3640
  - 8x Vicon Vero v2.2 (infrared 2.2MP cameras, 330Hz, 6-12 mm varifocal standard/wide lens, tripod heads, super clamps)
  - Vicon Lock Lab (64x analog input channels, 8x sync ports)
  - 1x Basic Life Science Kit from Vicon
  - 2x AMTI BMS400600-2K-SYS (including 4 pairs of thru top mounting, OPT-SC signal conditioning system)
  - 1x Delsys Trigno Avanti Research+ System (8x Trigno Avanti, 2x Trigno Galileo, 2x Trigno Avanti Mini, Trigger Module, open-end analog output cable for interfacing with Vicon Lock Lab)
  - 1x OT Bioelettronica Sessantaquattro (64-channel biosignal wireless amplifier for EEG recordings, including a 64-channel cap)
  - 1x Motorized Stretcher
  - 1x 4K 65" LED Monitor (for biofeedback)
- Major Software: Vicon Nexus 2.0, Vicon Polygon, AMTI NetForce, Delsys EMGWorks, Delsys NeuroMAP, OT Biolab+*