

User Experience with Wearable Motion Sensors

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Outline

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 - Workgroup
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 - Thoracic Sensor
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- Conclusions

Introduction

Workgroup



CETpD Technical Research Centre for
Dependency Care and Autonomous Living

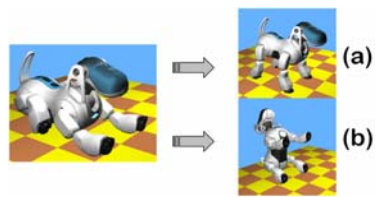
Introduction

Motivation

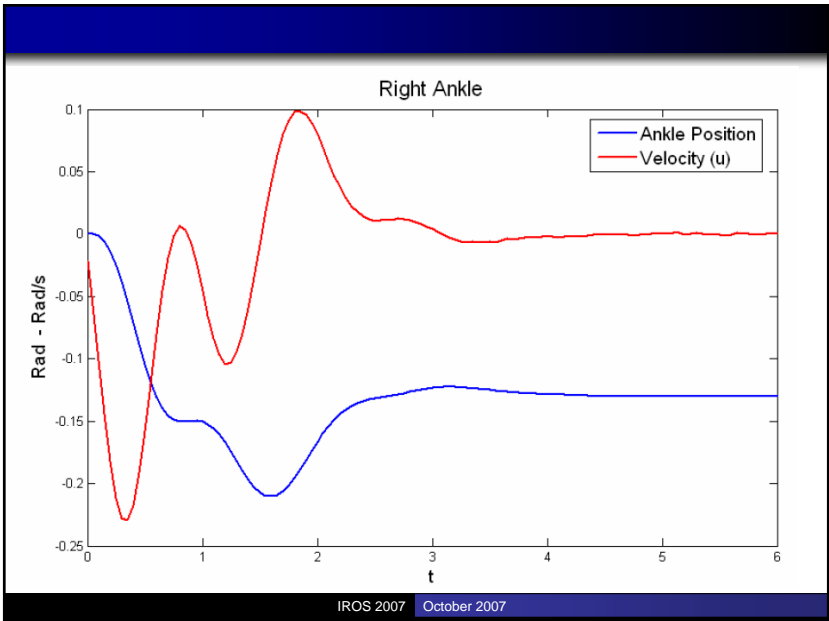
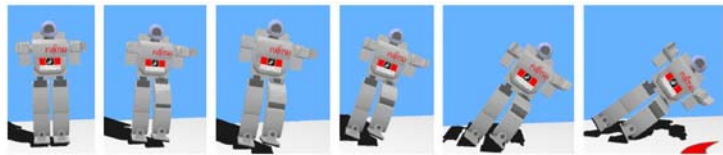


Introduction

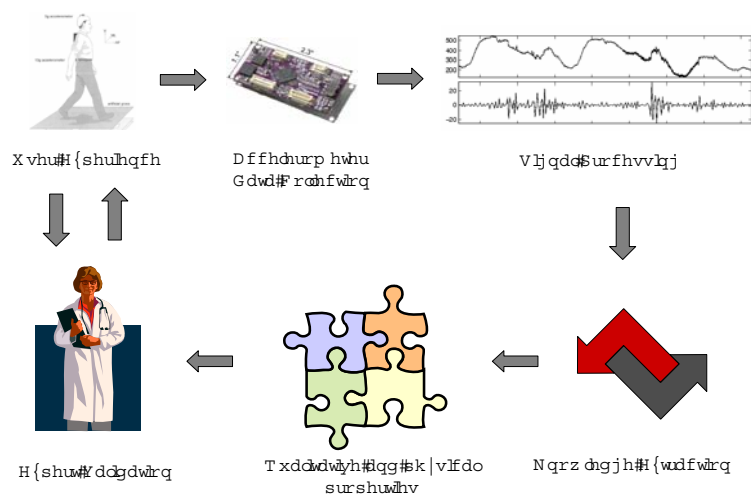
Motivation



Humanoid One-Leg Standing
- Failure Demonstration -



Knowledge Extraction



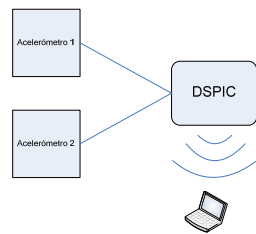
Introduction

Objectives

- ➔ Activity Monitoring
- ➔ Human Motion Quality
- ➔ Spatio-Temporal Gait Properties
- ➔ Lateral Displacement

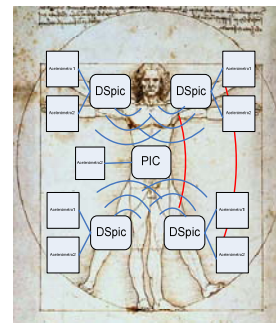
Wearable Inner Sensors

Thoracic Sensor



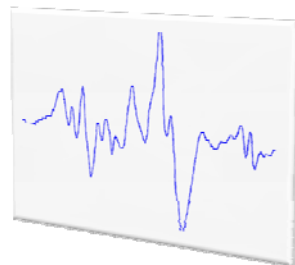
Wearable Inner Sensors

Multi-node Sensor



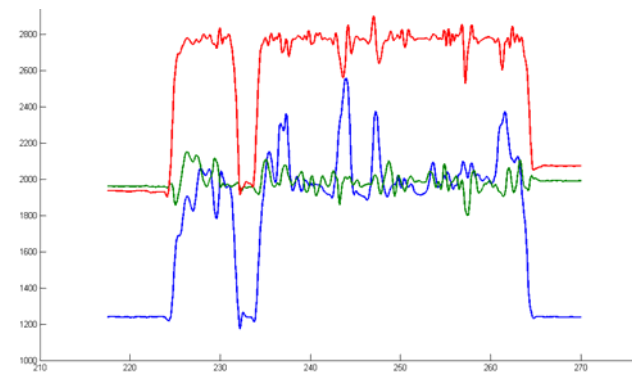
Wearable Inner Sensors

Learning from Experiences



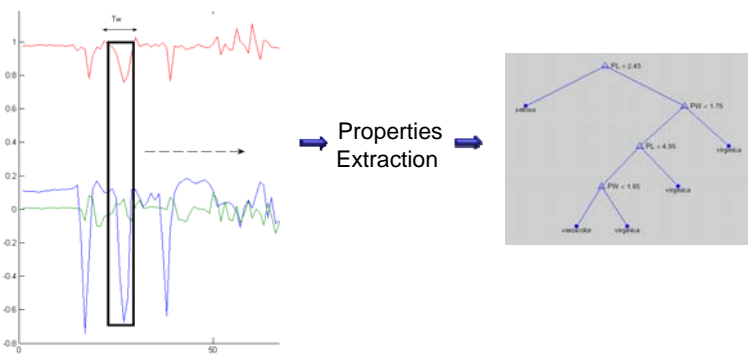
Knowledge Extraction

Activity Monitoring

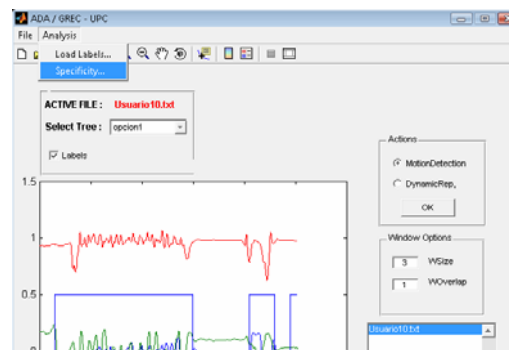


Knowledge Extraction

Activity Monitoring

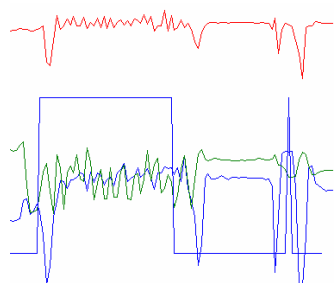


Developments



Results

Activity Detection



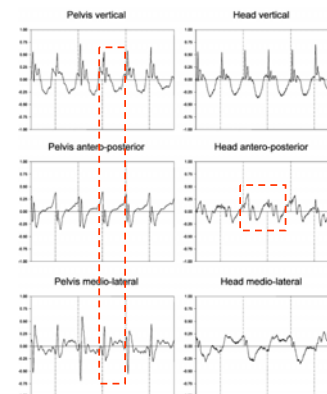
Data Info		TRUE	FALSE	P. Predictive
C1	40	1		0.97561
C2	55	0		1

Sensitivity: 1 Specificity: 0.98214

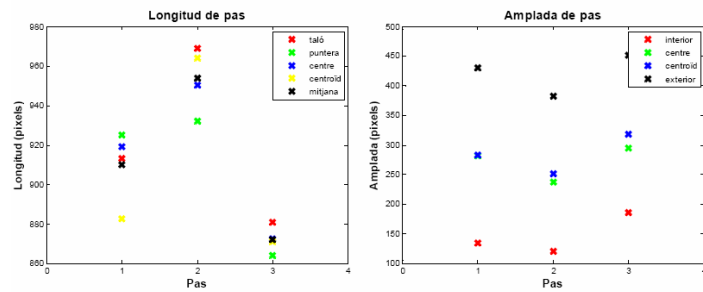
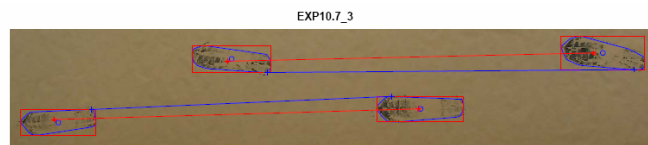
Spatiotemporal Properties

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0Hghuj |
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 0F dghqf | #vws p lq,
 0Vws #Vulgh,#hjqjk
 0Vws #lp lqj #v dulleclw|
 0Vws #z lqk
 0D up #z lqj #hntxhqf |
 0Vwp edi#s lvrgh
 0Z dclj #vshg#
 0J dl#F |fd#v,
 0J dl#v/xssruw
 0Srvkuhv#vudqv#lrcv
 0BBBBBB#Dq |#ghd#B#s,



Spatiotemporal Properties



Conclusions

- ★ From robots joint space to human task space
- ★ Falling risk observation based on simple inner sensor
- ★ Solution based on simplicity and user oriented viability

Questions Time