

# SPORTS ANALYTICS

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# SPORTS ANALYTICS

5BN/year market

- 
- #1 Collect data
  - #2 Analyse them
  - #3 Automatically

# SPORTS ANALYTICS

5BN/year market

# MAIN SPORT-TECH CLUSTERS



Athletic  
Performance



Smart  
Arena



Immersive  
Media



Fan  
Experience



Club  
Management

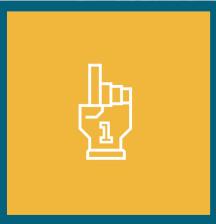


E-Sports

# MAIN SPORT-TECH CLUSTERS



Athletic  
Performance



Fan  
Experience



Smart  
Arena



Club  
Management



Immersive  
Media



E-Sports

# AT OUR DEPARTMENT

PlayeRank



AZIENDA SPINOFF  
DELL'UNIVERSITÀ DI PISA

# TENNIS COMMANDER

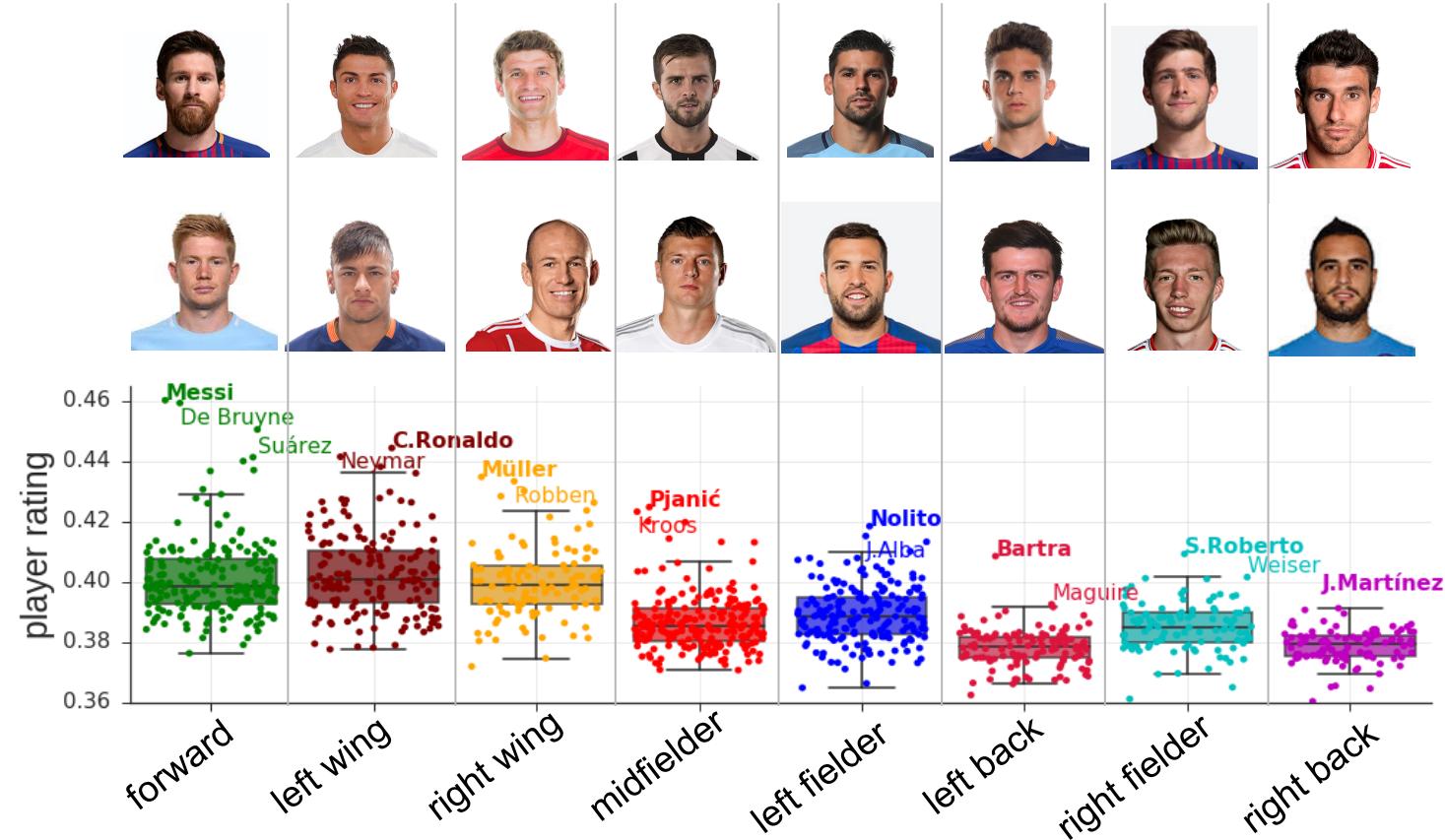


A watch over your game



AZIENDA SPINOFF  
DELL'UNIVERSITÀ DI PISA

# PlayeRank data-driven performance evaluation



## Collaborations



**FC Barcelona**  
Spain



**Ferencvárosi TC**  
Hungary



**Philadelphia 76ers**  
USA



**Univ of Connecticut**  
USA

## Injury Forecasting

Done: AI-based Injury Forecaster (IF) for soccer players

Ongoing: Explainable AI tool to help staff interpret predictions the IF

**Future work:** Generator of injury-free training plans, based on Adversarial Learning and Generative Adversarial Networks (GANs)



# Collaborations



**UEFA**  
Europe



**Fraunhofer**  
Bonn, Germany



**Northeastern Univ.**  
Boston, USA



**Queen Mary Univ.**  
London, UK



**FIGC**  
Italy

**wyscout**

**deltatre**

# Tactical Analysis

Done: AI-based evaluators for teams and players

Ongoing: Explainable AI tools for forecasting career evolution of players and performance of teams

## Future work:

- Match simulators based on GANs
- Optimal team formation
- Automatic commentator



## Un algoritmo para saber cuándo se va a lesionar un jugador

Los especialistas afirman que las soluciones tecnológicas para evitar daños en los atletas profesionales están todavía en fase embrionaria

DAILY NEWS 3 August 2018

## Football teams secretly using AI to predict injuries before they occur

## Stop agli infortuni e mercato al top Con due algoritmi cambia il futuro

Cnr e Università di Pisa hanno creato due sistemi di intelligenza artificiale

La Gazzetta dello Sport

## L'intelligenza artificiale aiuta i calciatori a evitare gli infortuni

Un algoritmo calcola con una precisione del 50% il rischio per il singolo calciatore di farsi male nell'allenamento successivo. Le stime attuali hanno una precisione solo del 4%. Alla ricerca partecipano Università di Pisa, Cnr e Università di Milano, nonché alcuni calciatori

SPORTE DATA ANALYTICS

## Infortuni previsti con precisione: arriva la manutenzione predittiva del calciatore



# TENNIS COMMANDER

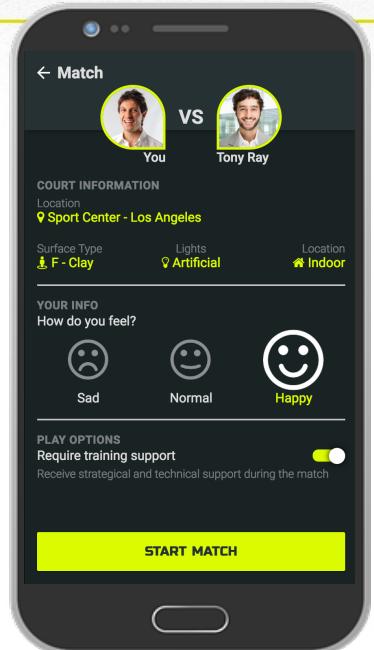
A watch over your game



Live Stroke analysis & Heatmap



Live AI data interpretation



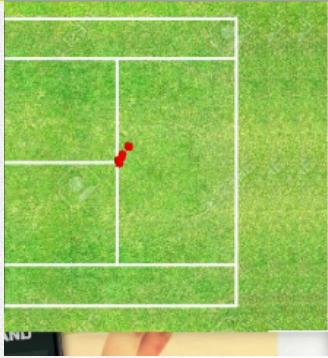
Social network



Video analysis



**TENNIS COMMANDER**  
A watch over your game



## Problem 1: position tracking

Video processing, with object detection + projection on the court, using keypoints to calibrate

## Problem 2: tracking arm's movements with smartwatch

Classification with supervised learning of the gesture  
(data from accelerometer and gyroscope)



## Problem 3: coaching

Profile of the player and adaptive expert system for real-time strategic support

## Ongoing & Future work:

- Effective position tracking for double
- Automatic calibration
- Pose estimation and ML to track arm's movements through video
- Energy issues
- Tackle other sports



## Colpi nello smartwatch l'app prototipo è italiana

Dall'Università di Pisa un nuovo  
passo avanti nel tennis connesso

Anno XII - n.22 - 8 giugno 2016  
**SUPER**TENNIS  
MAGAZINE

Pag.22

WEARABLE

Every tennis player's pet peeve is underperforming during a game, for no apparent reason, has this ever happened to you?

**tennis  
world**



Tennis, sarà uno smartwatch ad allenarti per il colpo perfetto

**CORRIERE DELLA SERA**

**wylab**

**FIT**  
FEDERAZIONE  
ITALIANA  
TENNIS

**HYPE**  
SPORTS INNOVATION

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