Our mission is to provide the most integrated real-time AI-driven multi-sport athlete performance tracking system in pro sports
Real-time
Live data and actionable insights to support evidence-based coaching and game management

Integrate: system
Fully mobile with private cloud and autonomous offline operation

Integrate: data
Entire player-tracking history and ability to receive input from other data sources

Artificial Intelligence
To unlock the full potential of our data through pattern recognition and predictive analytics

Multi-sport
Smooth system adaptation across sports with player customization
Barin Pro Gen 3

- GPS
- Glonass
- Beidou

Match-box sized device and heart rate monitor

Base station is private cloud in-hand & functional offline

Cloud Data Back-up (optional)

Proprietary radio protocol

Secure wi-fi

Tablet for real-time visualization & analytics
Barin Pro Gen 3

- Condition
- Performance
- Tactics
- Real-time
Where we are now **Barin Pro Gen 3**

**Performance**
- Speed
- SpeedAVG
- SpeedMAXX
- Total Energy Expenditure
- Metabolic Power
- Dynamics Indicator
- Anaerobic Index
- Count Sprints
- Count Accelerations
- Count Decelerations
- Change Direction Left
- Change Direction Right
- Work Ratio
- Distance in speed zone 1
- Distance in speed zone 2
- Distance in speed zone 3
- Distance in speed zone 4
- Distance in speed zone 5
- Total Distance
- Equivalent Distance
- High Metabolic Load Distance
- Last Sprint Distance

**Condition**
- HR
  - Average HR
  - HR Zone 1
  - HR Zone 2
  - HR Zone 3
  - HR Zone 4
  - HR Zone 5
  - Recovery Time
  - Recovery Time Top
  - Heart Exertion

**Tactics**
- Distance between players
- Distance between lines
- Squad length
- Squad width
- Heatmap
- Thirds
- Formations
- Goals Scored
- Goals Conceded
- Yellow Card
- Red Card
- Starting 11
- Tactical Formation
Our goal
360º Sports Team Management...

Powered by AI

Real-time
Vision
Advanced Tactics
Condition
Medical
Performance
Remote Unit

- 9 axis inertial measurement unit
- precise GPS module
- proprietary long range radio module
- wifi and bluetooth module
- up to 32 GB embedded memory
- i.MX RT MCU
- powered by **NuttX**
Remote Unit software organization

NuttX user space

Barin sports algorithms and application

NuttX Kernel Space

Nuttx kernel, high-level drivers, network stacks

low-level drivers (MCU specific)

Hardware

sensors, power control and other peripherals
Why NuttX?

- easy and well known application development (very similar to Linux)
- many supported features as file systems, network stacks, external memories and others
- application portability to different MCU (supported by NuttX)
- easy application porting from Linux to NuttX
Challenges which we faced

- Creating initial port for new MCU in NuttX (i.MX RT) - Special thanks to Mr. Gregory Nutt for his help in the initial port and to all other developers which work on the support of i.MX RT family
- writing the required low-level drivers
Fota update

- Proprietary radio
- eMMC memory
- i.MX RT
- QSPI Nor Flash
- Download firmware
- Store the firmware
- Read Firmware
- Write Firmware
- FTL block driver
- MTD memory driver
- FlexSPI
Ongoing contributions

- MTD driver for IS25LP128 QSPI NoR Flash
- FlexSPI driver for i.MX RT
- Add support for fast mode operation for eMMC memories MMC 4.5 standard
- Implement dynamic clock change algorithm based on CPU load
- Libraries and APIs for Artificial intelligence
Thank you very much!

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