# EQUINOMATH

*Improving horses performance through tracking and optimization*

H2020 SOCIETAL CHALLENGES: Health, demographic change and well being

PRODUCTIVE SECTOR: Electronics

## PROBLEM DESCRIPTION

McLloyd tracker provides accurate speed and position estimates of horses in a race. How these data could be useful to improve selection and training?

## CHALLENGES AND GOALS

The aim is to provide a profile of the best strategy for a fixed distance, to understand the effects of changes in altitude and curves on the track. For each type of race, we determine the best horses profiles.

## MATHEMATICAL AND COMPUTATIONAL METHODS

McLloyd's miniaturized tracker provides data on all the parameters of the horses running a race. Combined with two physics principles (energy conservation and Newton's second law), a solver compute the global optimal strategy for horses on a fixed distance. Small perturbations on the tracks (bending or slope) may lead to drastic changes on the optimal solutions. The race is then reconstructed in virtual reality and various combinations may be tested.

3D / AR / VR HORSE TRACKING SECTIONNAL TIMING

OVERLAY TV TEMPS-REEL

The data recorded by the McLloyd tracking device allow to live the race in virtual reality

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## Results and Benefits

Once we have the tracking data for a horse on a race, we compute realistic imaginary races on other tracks using optimization techniques. This should help to determine on which race to enter a horse. The project was supported by AMIES who allowed to hire an engineer.

**The tracking device together with the mathematical model allow to improve races strategy and horse training.**

Improve horses performance

Digital Twin

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McLLOYD