



Understanding greyhound race track risk factors

Professor David Eager

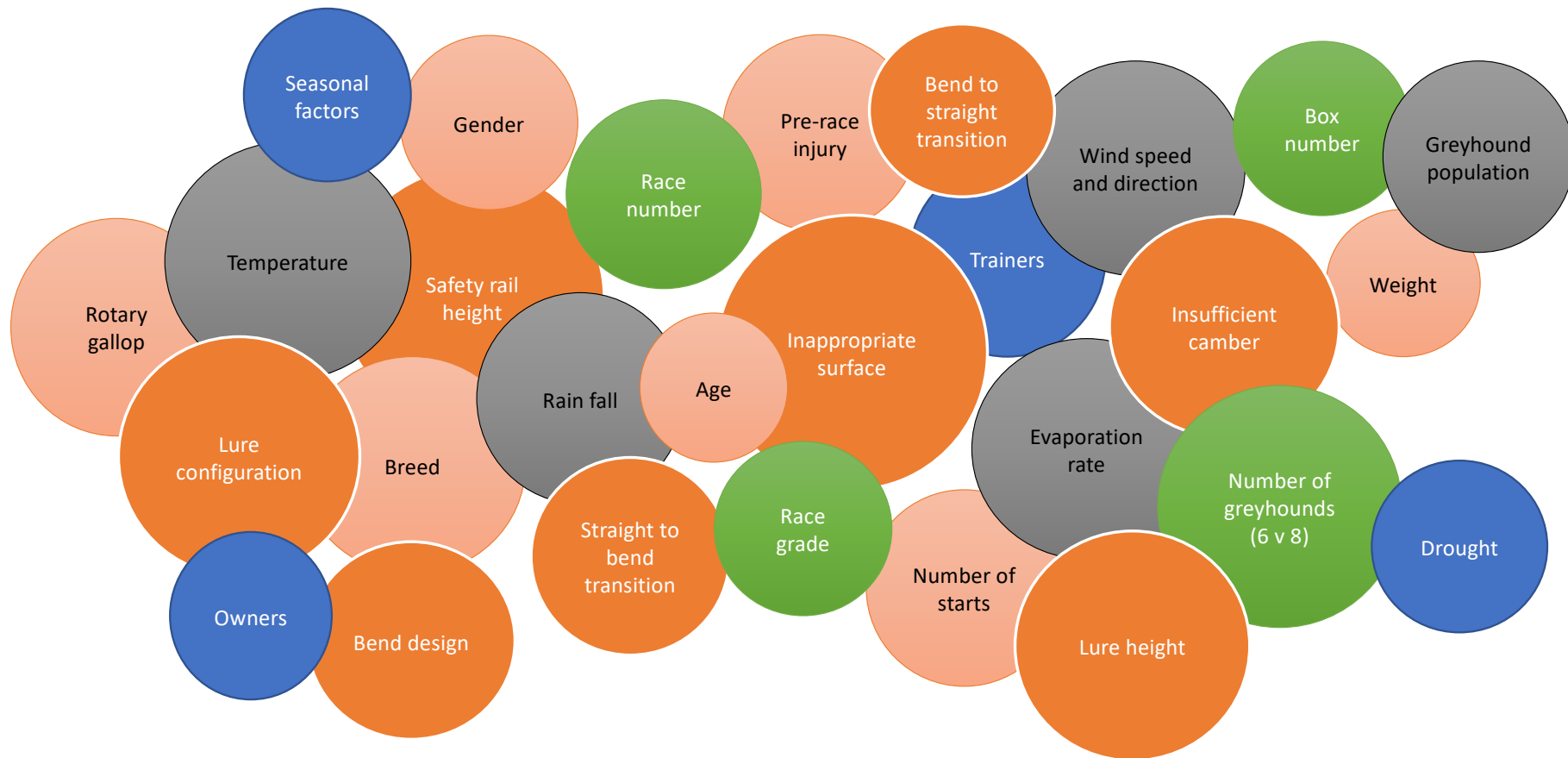
Dr Hasti Hayati

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Outline

1. Injury contributing factors
2. Risk factors
 - a) Track design
 - b) Track preparation and maintenance
3. Brief overview of UTS research

Injury contributing factors



Track design risk factors

- Tight bends
- Insufficient transition length into and out of bends
- Change in the camber between bends and straight sections
- Inappropriate track surface
- Inappropriate lure configuration

Track preparation and maintenance

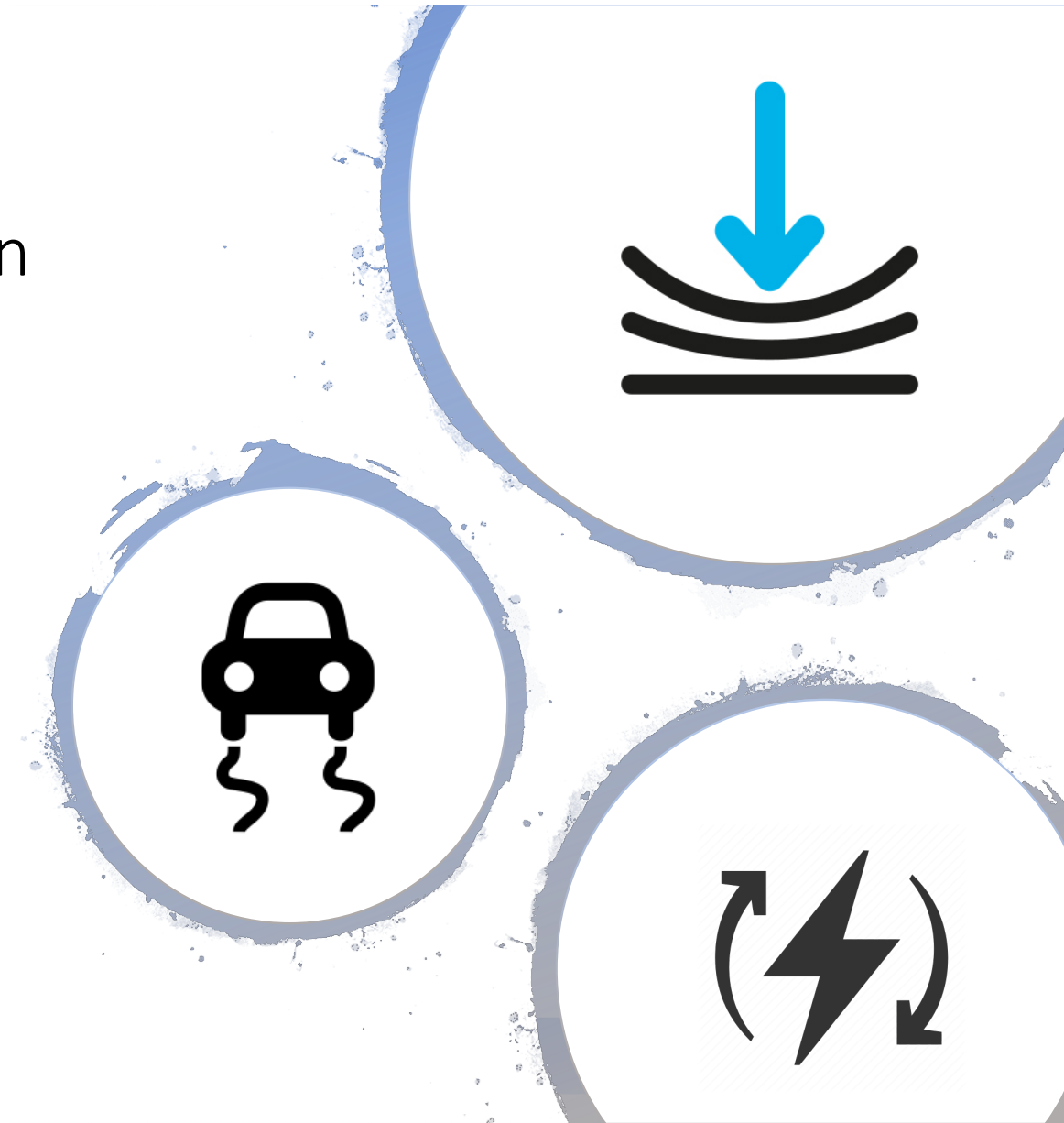
Minimum safety track surface standards, including:

- Monitoring and maintaining the track surface pre-race and during the race meeting to an 'as built' state
- Harrowing, brushing and trimming the surface to ensure a consistently flat surface, sand profile with no layers, and deep and even water penetration
- Light grooming after each race and trial session and replacement of track water lost through drainage and evaporation
- Track surface grades and cross-falls to ensure compliance with the minimum industry standards
- Elimination of sudden changes in the track surface grades and cross-fall

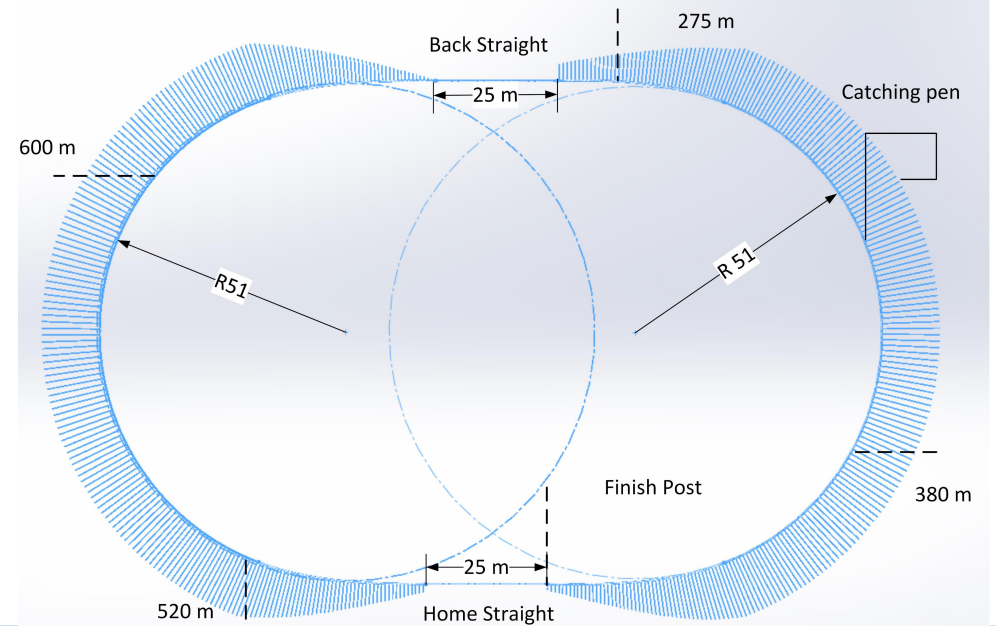
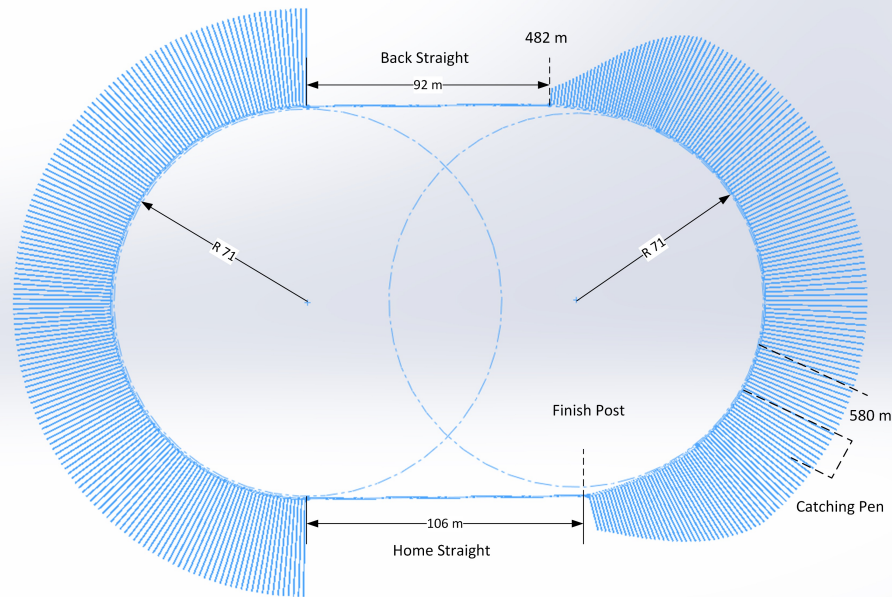
Appropriate surface design

Ideal surface should:

1. Impact attenuation paw impact
2. Enough traction for a controlled gallop
3. Provide appropriate amount of energy return

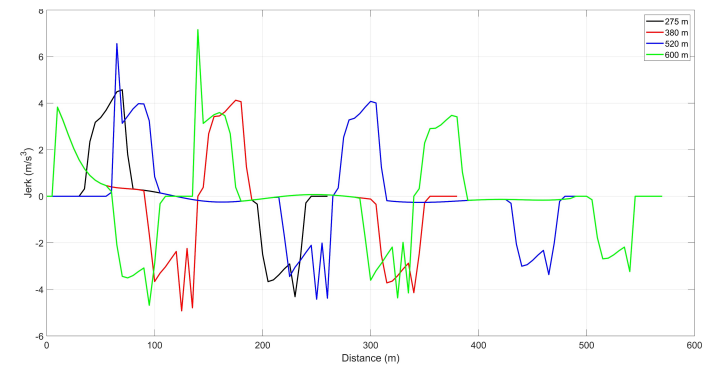
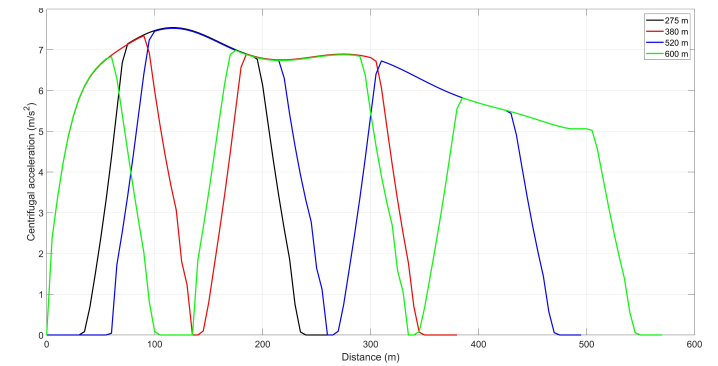
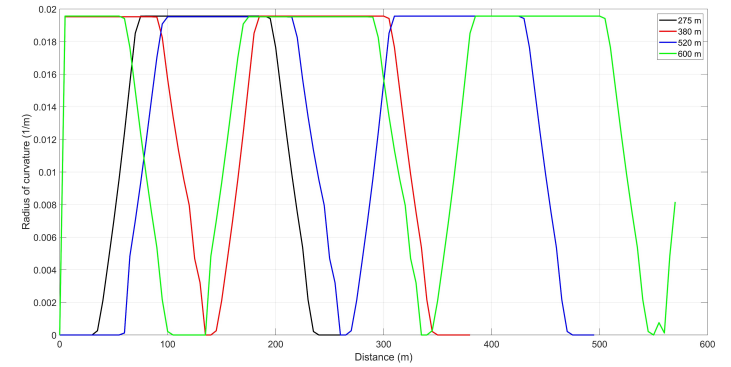


Overview of UTS progress on track design



UTS track design

Examples so some of the graphs UTS uses to determine inappropriate bend design



Previous, current and future research

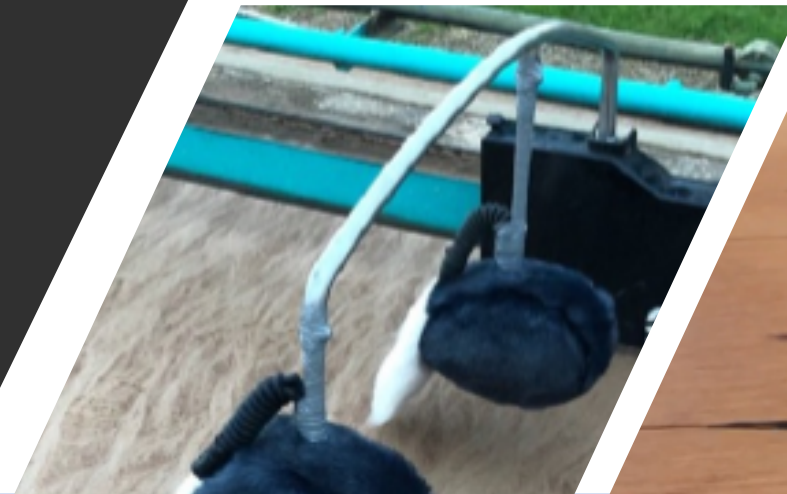
- Continuing research on the impact of surface type on greyhound biomechanics
- Continuing on research on the proper transition required on bends to minimize the effect of centrifugal acceleration which causes greyhounds to lean and have a asymmetrical gallop
- Deep data mining using AI technology to identify contributing injury factors

UTS is also deploying Industry Technology 4.0 methodology to:

- Measure greyhound galloping dynamics by using high-tech sensors
- Create a digital twins of racetracks and simulate the race and study the effect of track dynamics on greyhound biomechanics
- Simulate greyhound biomechanics using cutting edge mathematical tools

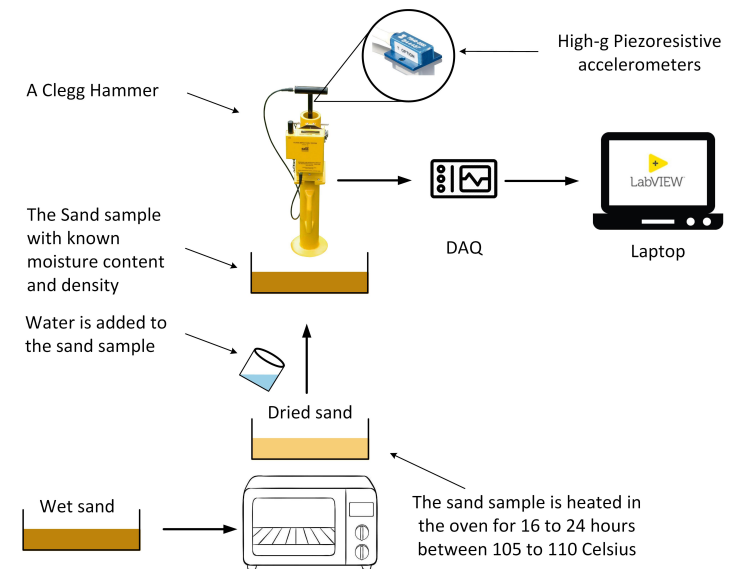
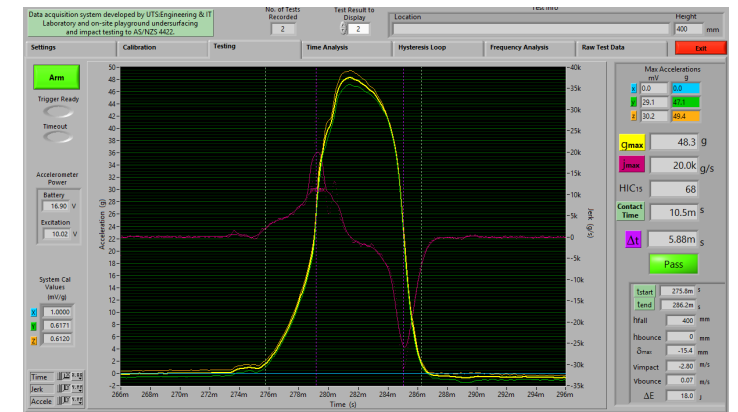
Overview of UTS work on lure configuration

- UTS published an interim report on lure height configuration in 2019 on the effect of lure configuration on greyhounds galloping biomechanics
- This is a work in progress and requires more data to make more informed evidence-based recommendations
- Based on current data the height of the lure appears to have a significant impacts on greyhounds galloping biomechanics

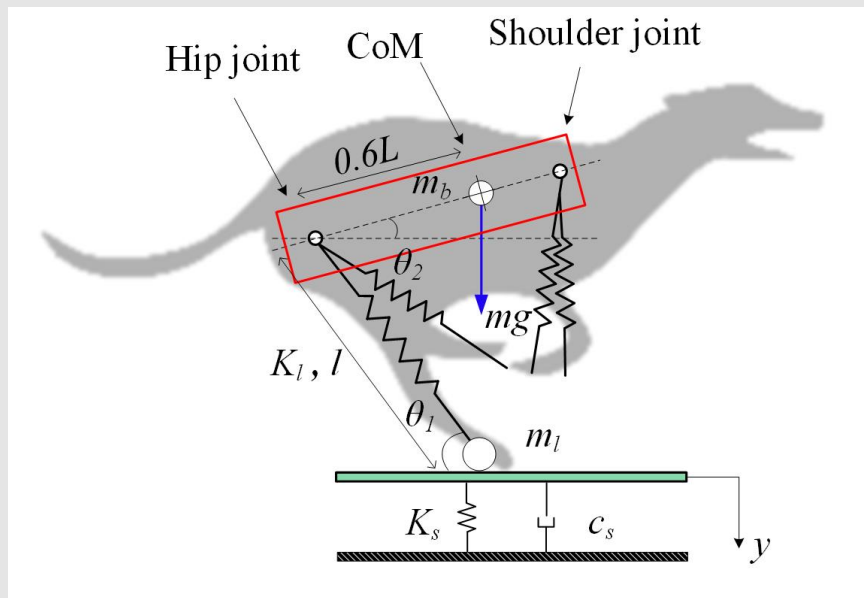


Overview of UTS progress in surface design

A novel impact test to measure the impact forces acting on greyhounds' limbs while galloping on different surfaces with different compaction rates and moisture content



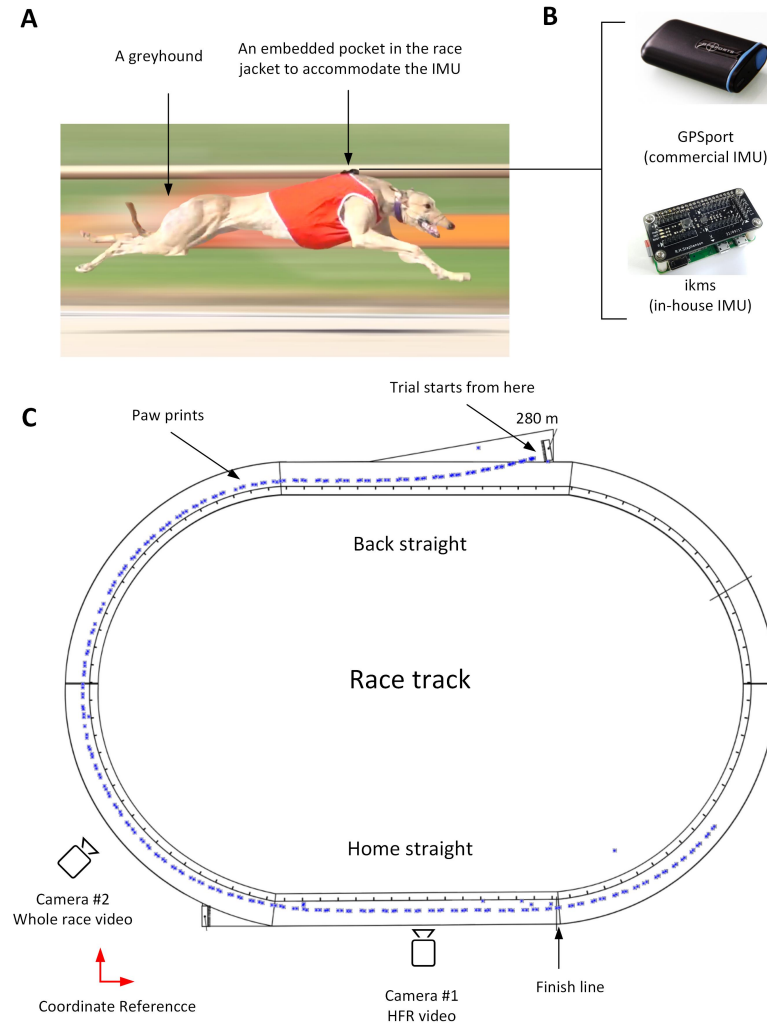
Overview of UTS progress in surface design



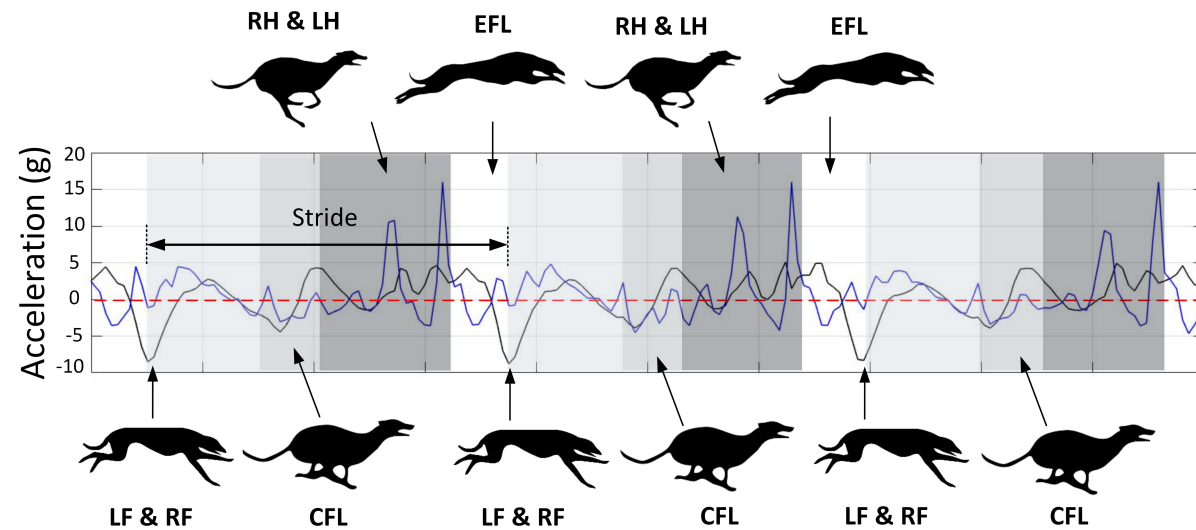
The effect of modifying the surface type on the forces exposed on greyhound body is being studied using this method

Technology 4.0 research conducted by UTS

- Measuring greyhounds galloping dynamics via UTS designed IMU



Industry 4.0
research
conducted
by UTS



- Greyhound forward and vertical acceleration while galloping