

# **Bespoke controllers and their impact on game feel**

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# Bespoke controllers and their impact on game feel

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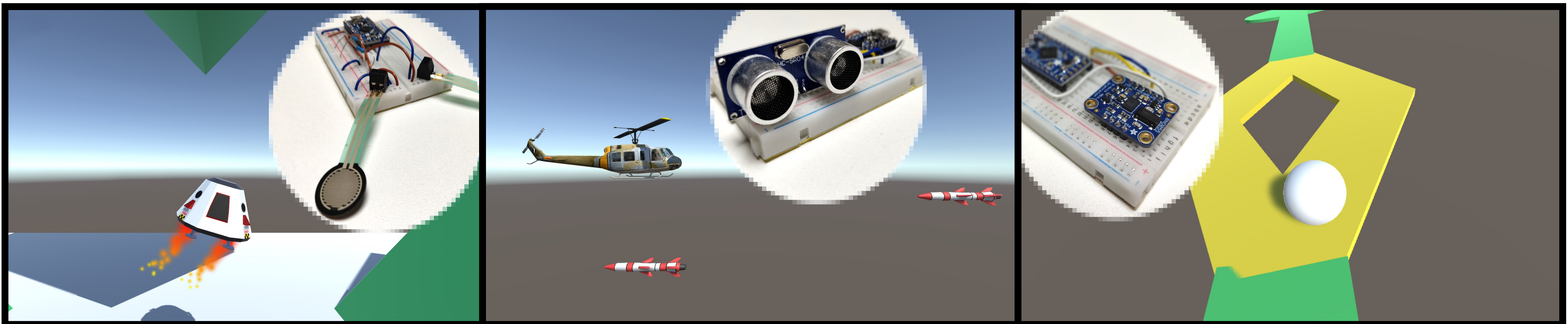


Figure 1: Controller prototypes and games. (Left) Pressure Controller, (Middle) Distance Controller, (Right) Orientation Controller.

## Introduction

Game feel is the intrinsic link between the player and the game (Swink 2017). A major aspect of this interlink between players and games is controls; the mapping of user input onto game actions. In this respect games are often limited or constrained by the traditional forms of input; keyboards and controllers.

## Project Aim

This project explores the use of prototype custom controllers in game development, investigating their impact on game feel and providing support materials and engaging with industry with this form of development.

Prototype controllers developed utilise a range of physical sensors for user interaction. Sensors such as; pressure, orientation and distance. These prototype controllers offer new and unique user interfaces forming the creation of new game control systems that may impact game feel and game accessibility.

## Methodology

The project developed a collection of prototype controllers and associated games each investigating and focusing on a different physical sensors as the primary form of input/control. Qualitative feedback on the user experience is being collected during showcasing and workshop events.

The project is building comprehensive development tutorials detailing the creation of the controllers and games. Additionally, the project will engage with game developers, students and educators through a series of workshops focused on the development of bespoke controllers and accompanying games.

## Prototype Controllers

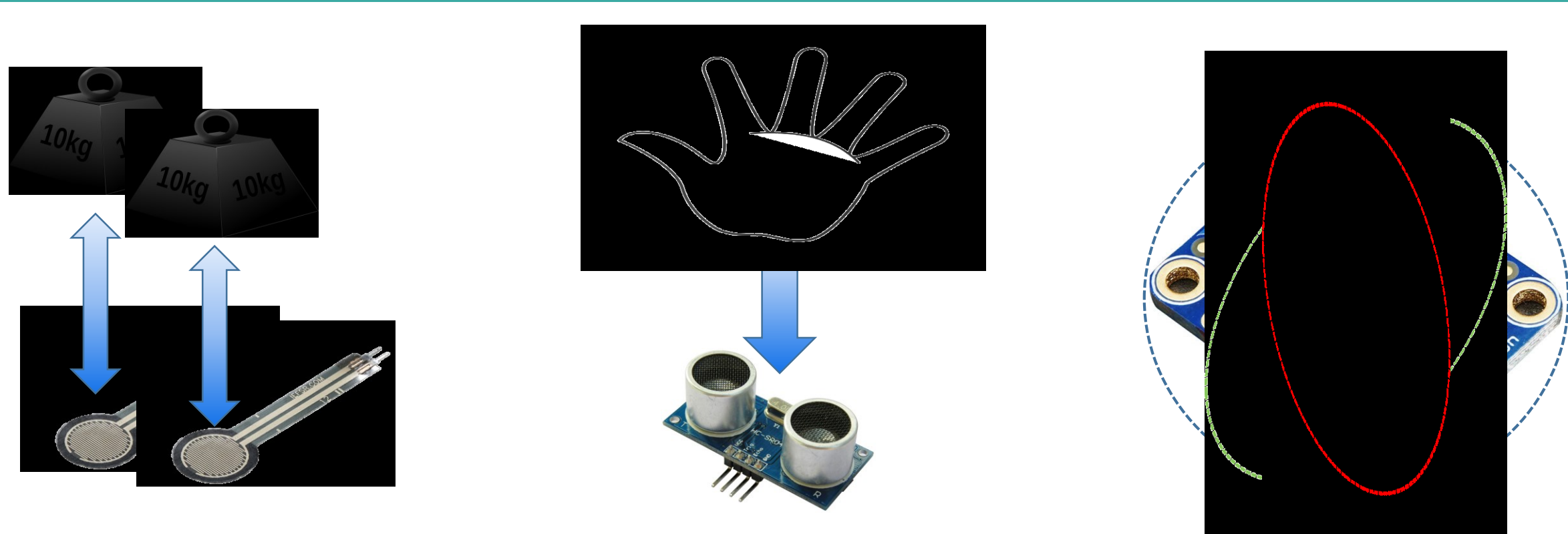


Figure 2: Sensors utilised: (Left) Pressure, (Middle) Distance, (Right) Orientation.

Figure 2 (left) pressure sensors track the amount of force being applied and transform that into a game input.  
Figure 2 (middle) the distance sensor tracks the distance an object, such as the users hand, is from the controller and translates that into user input.  
Figure 2 (right) the orientation sensor tracks the controllers absolute orientation, including gravity and magnetic north, allowing the device orientation to be used for input.

The project has developed 3 prototype controllers: a controller using pressure sensors (figure 1 left), a controller using a distance sensor (figure 1 middle), and a controller using an orientation sensor (figure 1 right). Each with a small game demonstrating it's use. For the pressure sensor, the more force applied to the sensor, the more upward force is applied to the spaceship allowing players to fly around. For the distance sensor, the height of the helicopter is controlled by the distance the users hand is from the controller. For the orientation sensor, the input data orientates the level to match that of the controller, having objects roll around the moving level.

## Tutorials

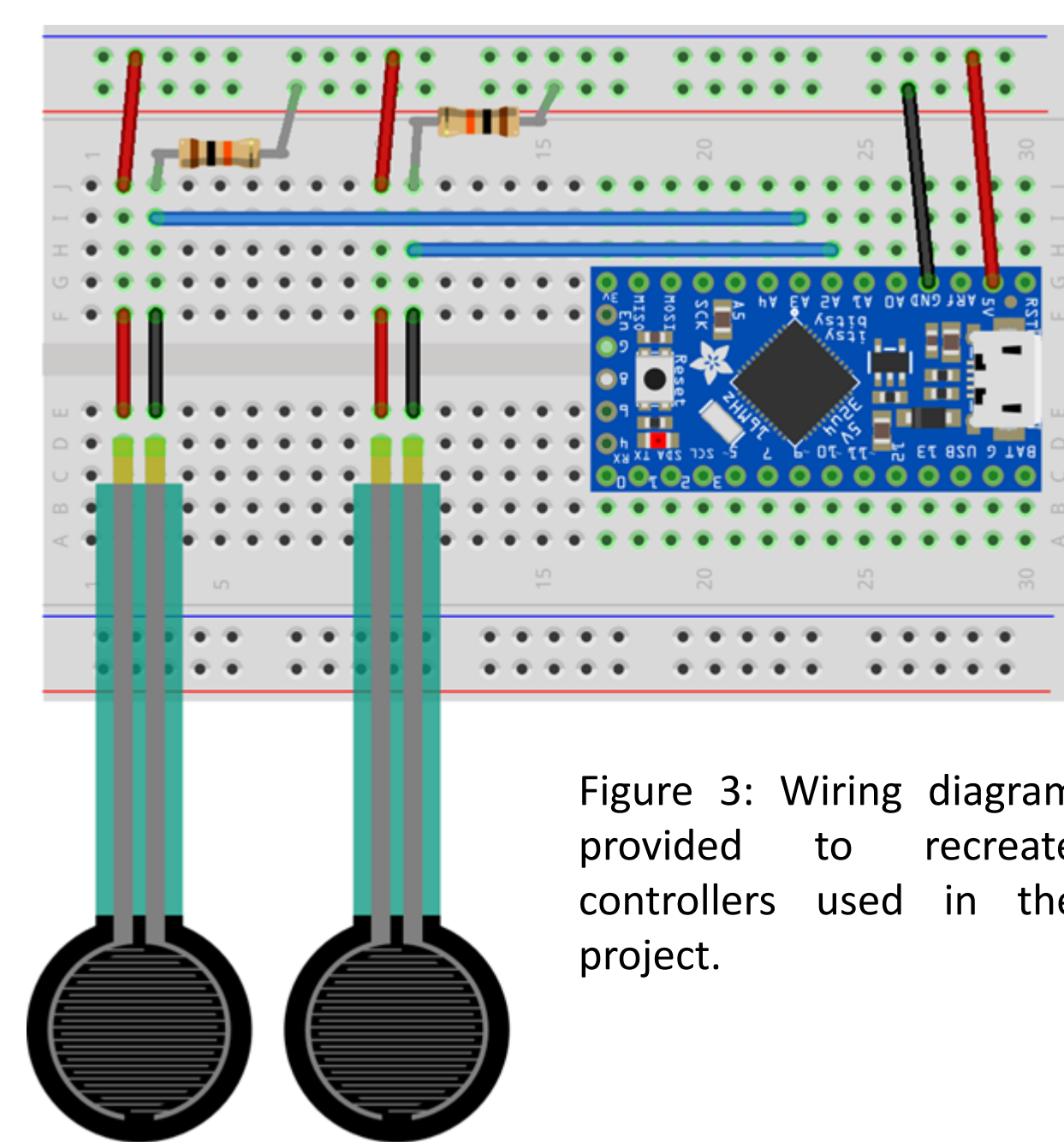


Figure 3: Wiring diagram provided to recreate controllers used in the project.

The project is in the process of publishing a collection of development tutorials. These development tutorials focus on the three prototype controllers already developed. Detailing the construction and providing source code, wiring diagrams (figure 3) and test games. Future work will provide more detailed tutorials aid in the re-creation of the controllers by 3<sup>rd</sup> parties. Providing detailed a guide and photos of the controllers construction.

## Workshops



The project is running workshops to engage with industry, game developers and education. Currently, the project has ran workshops and showcasing events at CounterPlay '19 conference and the InGAME '19 launch event. The workshops gave participants pre-configured controllers and example game projects to work with. Challenging participants to create new games with the prototype controllers.

Figure 4: Controller workshop at Counter Play '19. The controller uses orientation sensors and was placed on players heads using tilt as the input. Augmenting the level based on how much the player leaned their head.

Swink, S. (2017). Game Feel. CRC Press.  
Swink, S. (2019). Game Feel: The Secret Ingredient. [online] Gamasutra.com. Available at: [https://www.gamasutra.com/view/feature/130734/game\\_feel\\_the\\_secret\\_ingredient.php?page=2](https://www.gamasutra.com/view/feature/130734/game_feel_the_secret_ingredient.php?page=2).  
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