

KTP | The Design of a Proprietary Electric Drivetrain for Off-Road Motorbikes

The KTP between OSET Bikes and the University of Brighton will deliver a functional prototype of an adult motor trials bike, capable of competing with the leading internal combustion adult bikes. OSET Bikes currently manufactures a range of off-road electric motorbikes for children in competition up to 14 years old. Therefore, the adult bike requires a step change in performance and controllability. The IP generated in the project, notably the development of a novel electronic clutch, is transferrable to OSETs existing products, adding further value.

The KTP also aims to embed a scientific design process using this project as an exemplar. This manifests as a focus on the engineering fundamentals, the quantification of performance targets and validated testing. This will enable OSET to reduce their product development time, increase quality and provide greater independence from suppliers.

This poster shows some of the many ways in which my work as a KTP Associate has facilitated the collaboration between industry and academia, benefiting the Knowledge Transfer Partnership. It also highlights a specific example whereby two lecturers from the University of Brighton were engaged as consultants for their expertise.



Dan Hicks

MEng, AMIMechE

Dan graduated from the University of Leeds with a First Class MEng in Mechanical Engineering and now works as a Knowledge Transfer Associate with OSET Bikes Ltd.

EMAIL: dan.hicks@OSETbikes.com
TEL: 01424 211804



KEEP+ Matched Funding Grant

I helped to prepare and submit a successful application for, and subsequently project managed, a KEEP+ Matched Funding Grant which was used to engage 2 lecturers at the University of Brighton to:

Provide a Comprehensive Review of UK Compliance Requirements

The field of off-road electric motorbikes is burgeoning and uses technologies from a range of industries making the applicable legislation difficult to identify. To ensure the most streamlined product delivery it is imperative to understand and implement the legislative requirements before starting a project. Working with **Dr. Dave Kennaird**, Senior Lecturer at the University of Brighton, a comprehensive review of legislation relevant to OSET was compiled. Dr. Kennaird's demonstrable research skills and experience in electrical legislation yielded concise and well documented advice allowing OSET Engineers to be fully engaged in other projects for the company.

Design and Manufacture a Proprietary Electric Motor Controller

The novel software in development at OSET required an easily programmable motor controller with a high peak current limit, compact package size and the ability to control audio and haptic feedback systems. By working with **Mr. Ian Watts**, Principal Lecturer and Course Leader at the University of Brighton, we were able to develop a specific solution in a tight project turnaround. Mr. Watts' experience with motor controllers, EMI and supplier contacts proved invaluable and he designed the controller in such a way that it can be programmed in familiar languages, accelerating the software development process. This would not have been possible with commercially available motor controllers.

Benefits of Working with Academia

The comparatively inexperienced team at OSET Bikes benefitted tremendously by working with Dr. Kennaird and Mr. Watts. Not only were the titular aims of each project delivered successfully but their skills as educators allowed a significant amount of the understanding to be effectively disseminated. This transfer of knowledge has upskilled OSET employees and has, and continues to have, a direct and meaningful benefit.

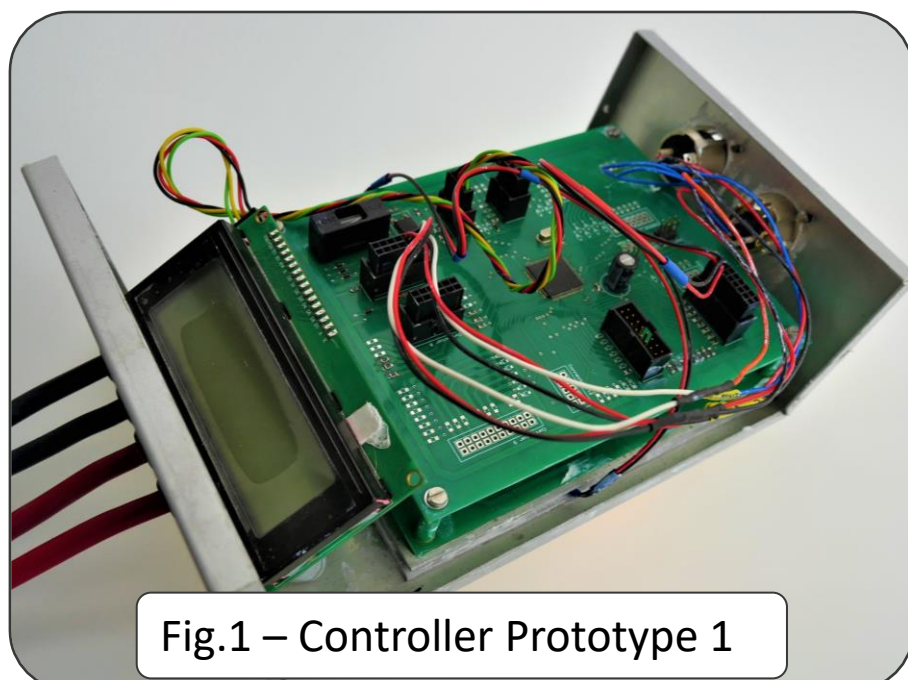


Fig.1 - Controller Prototype 1

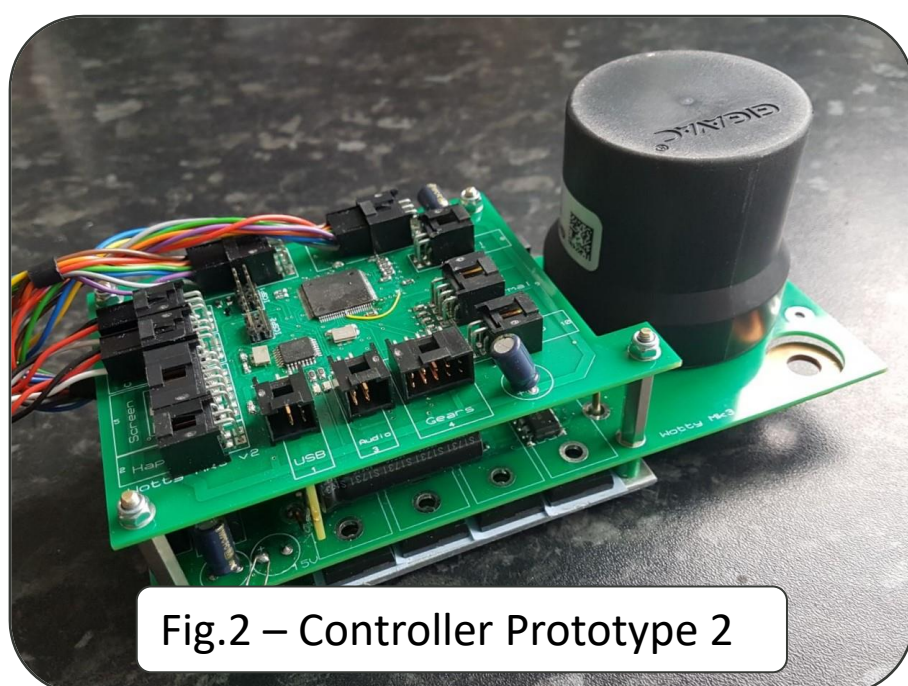


Fig.2 - Controller Prototype 2

Other Examples of Collaboration



Designed and manufactured a chassis dynamometer to quantify engine performance

Based on an existing dynamometer at the University of Brighton with the inclusion of modern torque sensors. Formed the basis of four XE636 final year projects.



Designed and prototyped a proprietary software clutch

Using CMM and CNC facilities at the University of Brighton and resulting in a case study publication submitted Exploring the Economic Potential of Replacing CNC with Composite Reinforced FDM in Low-Volume Production.



Designed and prototyped a proprietary gear reduction

Working closely with UK based motor suppliers and specialist manufacturers and using CNC facilities at the University of Brighton.



Designed and manufactured three test rigs to BS ISO 16029 and BS ISO 4210

Used to assess impact, fatigue and overload performance. Utilised in five XE636 student projects with the design of one rig replicated at the University of Brighton for academic use.



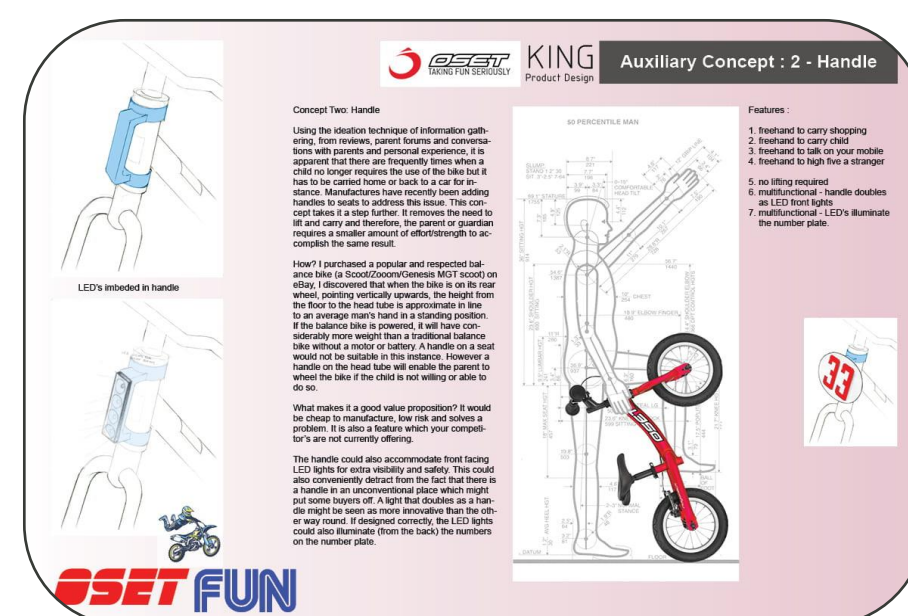
A student designed OSET's new User Experience

Following a funded student project from the University of Brighton the design will feature on new production OSET motorbikes.



Research Laboratory Established in the University of Brighton's Advanced Engineering Centre

Used for student projects which are linked to live research and enterprise projects.



Provided Industry basis for eleven student Projects

Industry based projects provide more exciting and applied projects for students to work on as well as providing industry access to University innovation.



Invited industry lectures and support sessions for a range of engineering modules

Showcasing real world examples of developing product specifications and control systems.

KTP No: 10765 - A partnership between:

