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| **Institute for Data Science and Artificial Intelligence (IDSAI)**  **Research Award Final Report** | |
| Name of PIs and department | PIs:  Catherine Russon, Mike Allen, Rob Andrews  Departments:  College of Medicine  The Exeter Centre of Excellence for Diabetes Research (EXCEED)  PenArc |
| Project collaborators (internal and external) | Exercise in Type One Diabetes (EXTOD), Motivate exercise program, |
| Project Start date and duration | Start: 01/08/2022  Duration: 5 months |
| Summary of any research costs incurred (up to a maximum of £500) |  |
| Please answer the following questions as fully as possible. Please attach any relevant supporting information to demonstrate project outcomes (draft papers, key figures, etc) | |
| Were there any major changes to the scope of the project as described in your application? (Max 150 words)  No, the project progressed as expected. | |
| Please describe the key outcomes from your project in terms suitable for a lay audience. Were the original project aims met?  (Max 350 words)  The aim of this project was to make a simple, flexible tool to calculate the metrics of glycemic control from continuous glucose monitoring (CGM) data.  Continuous glucose monitors are an exciting new development in the management of type 1 diabetes (T1D). These devices give glucose readings every 5 to 15 minutes, providing large amounts of data and providing potential for unprecedented insight into glucose dynamics throughout the day. NICE has recently announced that all people with type 1 diabetes will receive a CGM. This dramatic increase in data will provide opportunity for significant advances in diabetes health research, but will naturally result in an increased demand for effective data analysis tools for non-technical researchers and clinicians.  The [international consensus on the use of continuous glucose monitors](https://diabetesjournals.org/care/article/40/12/1631/37000/International-Consensus-on-Use-of-Continuous) (CGMs) has identified several metrics of glycemic control that are important for assessing and optimizing diabetes management. However, the current platforms on which CGM data analysis can be performed are proprietary, closed source and limited in terms of functionality. The glucose data can be analysed with some basic metrics but cannot be explored in any more flexible or complex ways. Consequently, researchers are exporting the data and calculating the relevant metrics manually, which is extremely time consuming and prone to error.  The idea of this project began when Cat was approached to try to solve this problem and the idea of a no-code WebApp for calculating the metrics of glycemic control was was born. The WebApp allows researchers to easily calculate the metrics of glycemic control whilst also providing unprecedented freedom to explore the data further. Diametrics can be used to calculate the commonly used metrics of glycaemic control, explore your data through interactive visualisations and break your data down into specific periods of interest. | |
| What has been the impact of the award? What has it enabled that couldn’t have been achieved otherwise? (Max 350 words)  *Along with academic impacts, please consider in your answer new research collaborations initiated, transfer of skills and personal career development*.  This funding has enabled me to createa a simple yet flexible WebApp to calculate the metrics of glycemic control. The code for this project is entirely open-source and available for other’s to reuse or scrutinise at their discretion. This is already being used to process the data for a large clinical trial.  I’ve had the opportunity to create in collaboration with an interdisciplinary team of researchers from EXTOD, Motivate, EXCEED, PenArc, the RSE team and Turing. I have honed my ability to work with groups of completely different specialists, improving my communication skills and ability to incorporate information from different sources.  Finally, I have been able to learn an entirely new skill in web development and dashboard creation. WebApps are an exciting new way to communicate science. Interactive dashboards enable people to engage with data, think critically and ask questions of us researchers - this can only be a good thing. This has therefore been a wonderful skill for me to develop and I look forward to using it again in other projects. | |
| What are your planned next steps, if any, for this piece of research/collaboration? (Max 150 words)   * The WebApp will be shared further among diabetes researchers, where there is already interest in the project. The feedback will be continually incorporated in order to improve the WebApp further. * This project will be published in either a diabetes or software journal and likely presented at the largest European diabetes conference (EASD) which will give the tool further endorsement | |