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On the development of low cost, optimizable, 3D printed turbine flow meters for pipe and open channel applications

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The work sets out a method and evaluates the accuracy of a 3D printed turbine flow meter for open channel and pipe flow; that can be optimised for different situations. The motivation for this project was to create flow meters that are low cost and available to community groups and interested individuals, this work was conducted as part of the CAMELLIA project (Community Water Management for a Liveable London). The flowmeters have been trialled in a number of locations by users with different skill sets and technical know-how. Hall effect sensors have been coupled with consumer grade electronics to develop the most opensource system possible. This work has taken advantage of recent advances in DLP printing, allowing for greater resolution at a lower cost than previous generations of 3D printers. This is combined with work developed by the Open Prop software team, has enabled user customisable sensors to be built.

The presented work aims to create an opensource, low cost and easy to use solution to some flow monitoring problems. This paper details the lessons learnt and successes of this approach; it aims to create a basis for which further development and deployment of these sensors can be achieved.