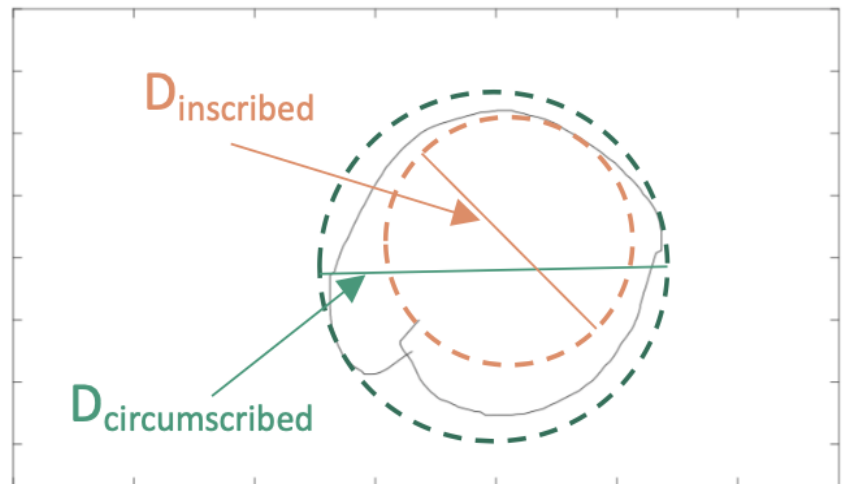


# Proposal for Digital Prewriting Assessments: Upgrading Data Capture and Analysis Capability

*Prewriting Skills* are fundamental skills children develop before they can write such as drawing lines and shapes. Early evaluation of these skills allows children who struggle with prewriting to be identified sooner. Currently, occupational therapists assess prewriting skills with pencil and paper tests: they show children a reference image of a simple shape and ask them to recreate that image. Therapists are limited in their ability to assess subtle differences between the reference image and a child's drawing. This leads to very subjective scores despite scoring guides intended to alleviate disparities.

To address these problems, Dr. Virginia Chu developed a more objective digital prewriting assessment system. It consists of two components, one to capture data about each of a child's drawings, and one to analyze data and score each drawing. However, Dr. Chu has found that without a single, fully-integrated application that can capture and score the assessments and be deployed on a multitude of touch enabled devices, she is unable to expand her current level of research in the prewriting skills of children.

Capstone team CS-23-321 proposes to upgrade the system by integrating the functionalities from the current two applications into a single web application, with a frontend to capture data and a backend server for analysis. For our prototype we will score drawings created in



response to one of the ten total assessment images Dr. Chu has provided. The application will split the screen evenly between an image of a perfect circle and an area for drawing.

*To score these drawings, we need to measure how round the drawn circles are. Roundness is defined as the ratio of the diameter of the largest circle that can be inscribed and the diameter of the smallest circle that can be circumscribed. A perfectly drawn circle will yield equal diameters, and thus a ratio of 1.*

Figure . Calculation of Roundness Score

The application will cut down processing time and increase the number of assessments that can be administered per hour, while providing a single source for data visualization. It will be versatile, transcending the barrier between different operating systems by “living” on a web server. Ultimately, the fully completed single page application will provide crucial support to Dr. Virginia Chu in her research and is critical to the successful execution of a large scale study on the prewriting skills of children.

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