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*Using CalcPlot3D to Create Dynamic Figures for OER Textbooks and to 3D Print Surfaces for
Multivariable Calculus and Beyond.* Preliminary report.

CalcPlot3D is an interactive online 3D JavaScript app designed to enhance the teaching and learning of multivariable calculus, but with many applications in other math, engineering, and physics courses.

This tool makes it easy to visually explore concepts and relationships between them. Through visual verification and exploration of problems involving surfaces, contour plots, curves, velocity and acceleration, directional derivatives, gradients, vector fields/phase portraits, etc., our project seeks to improve students' geometric intuition so they more fully understand the application of these concepts in other STEM coursework.

CalcPlot3D can be used to create dynamic figures for online OER textbooks (e.g., LibreTexts and PreTeXt) as well as for ordinary web pages. This process takes a standard textbook figure and transforms it into a dynamic, user-interactive, rotateable figure.

CalcPlot3D can also be used to generate STL files to print surfaces and solids on 3D printers. So you can now not only view 3D surfaces, curves and vector fields in the app using 3D glasses, you can also 3D print the surfaces, knots, and solids to experience them in true 3D.

See <https://sites.monroecc.edu/multivariablecalculus/> This project is funded by NSF-IUSE 1524968. (Received September 24, 2018)