

1125-AG-1716 **Paul E Seeburger*** (pseeburger@monroecc.edu), 1000 E. Henrietta Rd., Rochester, NY 14623, and **Monica VanDieren** and **Deborah Moore-Russo**. *Collaborative Research: Improving Conceptual Understanding of Multivariable Calculus Through Visualization Using CalcPlot3D*. Preliminary report.

Our project seeks to improve students' geometric intuition (both 2D and 3D) about surfaces, vectors, vector fields, and curves, thereby better preparing students to more fully understand engineering and physics problems in their STEM coursework. At the core of our project is CalcPlot3D, an interactive online 3D JavaScript app designed to enhance the teaching and learning of multivariable calculus. This app brings the concepts of multivariable calculus to life and makes it easy to visually explore the concepts and relationships between them. It facilitates the graphical representation of many multivariable concepts including contour plots, velocity and acceleration, directional derivatives, and gradients.

In addition to the creation of this app, our project seeks to create a series of new visual concept explorations and applications to improve student understanding of multivariable calculus, differential equations and linear algebra and to use the app to conduct research investigating how student understanding of multivariable calculus concepts changes through the use of visualization and dynamic concept explorations.

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