

1106-VR-2514 **Deborah Vicinsky*** (vicinsky@uoregon.edu). *Goodwillie calculus in the category of small categories.*

Goodwillie calculus, also known as the calculus of functors, is a method of approximating a functor $F : \mathcal{C} \rightarrow \mathcal{D}$ between two well-behaved model categories by more homotopically friendly functors similar to how one uses Taylor series to approximate functions by polynomial functions. The category of small categories, denoted \mathcal{Cat} , has small categories as objects and functors as morphisms. I will show that the derivatives of the identity functor on \mathcal{Cat} are zero, i.e. the zero object in the category of spectra on \mathcal{Cat} . This example is analogous to the example $f(x) = e^{-1/x^2}$ for $x \neq 0$ and $f(0) = 0$ in regular calculus. That is, the derivatives of the identity functor exist for all objects of \mathcal{Cat} , but the Taylor tower only converges to the value of the functor at the zero object. (Received September 16, 2014)