

1154-45-2644

**Udita N. Katugampola\*** ([uditanalin@yahoo.com](mailto:uditanalin@yahoo.com)), Department of Mathematical Sciences, Florida Polytechnic University, Lakeland, FL 33805. *New Fractional-like Derivative with Dynamic Memory: Theory and Applications*. Preliminary report.

One of the advantages of the non-local formulation of the fractional derivative is that it carries a memory effects. The question is that “Do we need to use the memory starting at a fixed point as in the Riemann-Liouville definition of the fractional integral or can it be dynamic?” The purpose of this note is to address that question in detail. It turns out that the fractional-like derivative defined in this way is not equivalent to any familiar fractional derivative even though there are several interesting relationships between them. As applications, we study several nonlocal models such as population dynamics. (Received September 17, 2019)