

1125-B5-2701      **Jonathan Dahl\***, dahlj@lafayette.edu. *Algorithmic generation of calculus problems: beyond random coefficients*. Preliminary report.

Typical open homework systems currently provide randomization only in problem coefficients, requiring separate code for structurally distinct problems. An assignment for differentiation practice, for example, will require the instructor to hand select each problem and rely on enough (correctly coded) examples to be available. This talk will discuss an algorithmic approach to providing problems with a randomized mathematical structure. In the case of differentiation, every “Find  $f'(x)$  where  $f(x) = \_$ ” problem is based on the same code, which roughly estimates the complexity of  $f$  and the difficulty of the problem during problem generation. Implementations for a calculus course will be discussed, as well as potential applications to algorithmic production of test banks with difficulty and quality estimates for each problem. (Received September 20, 2016)