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Monte Carlo methods for integro-partial differential equations sample the underlying stochastic process generating the equation. As the sample size increases, improved approximations of the integro-partial differential equations result. Monte Carlo methods are typically used for equations with more than three dimensions or when the quantity of interest only involves a portion of the solution.

My poster will review the problem of computing derivatives for the various quantities of interest estimated during the Monte Carlo simulations. These derivatives, or sensitivities, pave the path towards a currently unavailable capability of design, optimization and uncertainty quantification, staples of modeling and simulation when only Monte Carlo simulation is available.

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