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Paper Title:	**Improving Cost Estimation in an Era of Innovation**

Abstract:

Many innovations are being proposed for spacecraft engineering and there are others that could be proposed. Some that offer opportunities to reduce spacecraft costs are disaggregating spacecraft functions, using commercial buses, relaxing mass limits, standardizing components and interfaces, modularizing systems, and using commercial design principles. Individually and together, they pose a severe challenge to spacecraft cost estimation.

To the extent that these innovations produce significant changes in spacecraft engineering and the cost of spacecraft design and manufacture, they will to the same degree produce discontinuities within the historical data series that drive parametric cost models. Since spacecraft programs currently depend heavily on parametric cost models for the early and middle phases of cost estimation, any significant wave of innovation creates an urgent demand for alternatives to fill the gap. This paper discusses possibilities for improving the scope, accuracy, and precision of each of the three major types of cost estimation: estimation by analogy, parametric estimation, and engineering analysis.