

Biowulf Assists a Pregnancy Researcher in Her Team's Labors

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Through analyzing vast quantities of data and simulations, CIT's supercomputer [Biowulf](#) can help research teams within NIH's Intramural Research Program (IRP) develop, improve, or discard statistical methods they've used. A recent post on IRP's I Am Intramural blog details [how Biowulf has contributed to the work of one IRP researcher](#) who studies fertility, pregnancy, and labor.

[Rajeshwari Sundaram, M.S., Ph.D.](#), is a senior investigator in the Biostatistics and Bioinformatics Branch of the Division of Intramural Population Health Research at the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). She examines age, weight, and other variables that affect everything from whether a woman can conceive to how her labor progresses.

Dr. Sundaram's team creates multiple datasets with multiple combinations of these variables. Each variable has its own correlation value. When any two of these variables appear in the same dataset, their correlation values indicate how closely associated they are with one another.

With the help of [Biowulf](#), Dr. Sundaram's team then applies algorithms to each custom dataset to determine whether their statistical methods produce the outcomes they expect. "[W]hen we run simulations, we do thousands of replications on various different sample sizes," she says. "It's like running thousands of experiments at the same time."

These thousands of experiments tell her team how well a statistical tool works, as well as how long it takes the algorithms to generate results.

Recently she's developed statistical methods that could improve how clinicians analyze data related to conception and labor. She sees machine learning, and Biowulf in particular, as crucial to helping doctors provide more precise and timely medical interventions to pregnant women, women trying to get pregnant, and women experiencing abnormal progression of labor.

"Biowulf is critical for that work," says Dr. Sundaram. "[A]ll my methods development is computationally intensive or uses big data, and machine learning with big data is where I see the future."