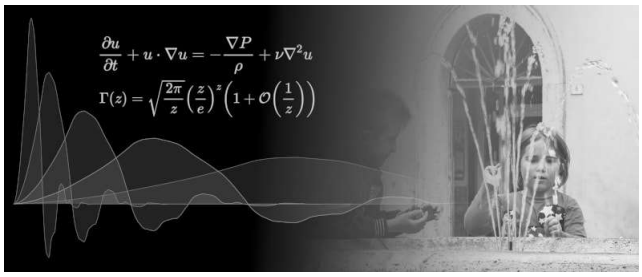
JOHN D. COOK
CONSULTING

Navigation

Applied mathematics



Applied mathematics is challenging because it requires a broad range of experience. Our team of experts has experience in a wide variety of areas of math.

- Probability
- Numerical analysis
- Differential equations
- Complex analysis
- Cryptography
- RNG/RBG testing
- Filtering
- Signal processing
- Radio applications
- Large-scale logic

We enjoy digging into real problems and doing whatever it takes to create a practical solution. We see projects through to completion, which usually means delivering more than a mathematical write-up. If it means developing software, or presentations, or documentation, or marketing material, we'll do what needs to be done.

"John helped us solve a vexing and festering problem. Reducing it to mathematics and then to code required educated guesses, creative assumptions, intuition, deep knowledge of digital signal processing, and shots in the dark. This is where John excels: just the right mix of practical urgency with mathematical rigor. It's difficult to overemphasize the difficulty of this problem and the acumen required to solve it completely and on a schedule. Just fantastic!" — Brian Beckman, PhD

Formalizing problems

Rarely does a client directly hand us a math problem. They come to us with a business problem that we formulate as a problem math can be applied to. A client might ask us to determine how likely a system is to fail or how long a battery is likely to last. They don't typically ask us to compute integrals, though occasionally they'll do just that.

We help clients take difficult problems and define them clearly, stating the objectives, constraints, and trade-offs. Then we produce mathematical models and solutions based on these models. Often this is an iterative process. We might quickly produce rough estimates, then refine them until the objectives are met.

Practical implementation

Sometimes clients have reduced their problem to a mathematical form, but need help implementing their model. Maybe they have a software implementation that works well on a beefy workstation but it needs to work in a low-power embedded device. Maybe they have reduced a problem a mathematical form that they cannot evaluate, such as a system of differential equations or a high-dimensional integral. We have lots of experience solving these kinds of problems.

Simplification

Companies often develop ad hoc models that evolve over time. The models work well enough for now, but they're too complex to understand and extend. If and when a key person ever leaves, the model will be unusable.

These companies need a new approach, one that takes advantage of what they know now that they didn't know at the beginning rather than, an approach that sees the existing model as a precious resource rather than something to be unceremoniously thrown away.

Verification

Often it is not enough for models to work well; a third party must verify that they work well. Maybe a regulatory agency needs proof that something has been adequately tested, or maybe a legal team needs expert testimony to defend the company's product in court.

Expert help

Call or email us to set up a meeting to discuss your projects and how we can help you achieve your goals.

LET'S TALK