Topics

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- classical time-series (ARIMA) models
- trajectory/gradient matching (Ellner, Seifu, and Smith 2002; Raue et al. 2013)
- Kalman filtering (basic & ensemble) (Schnute 1994)
- Integrated Nested Laplace Approximation (INLA)
- particle filtering: pomp (Ionides, Bretó, and King 2006)
- MCMC: JAGS/BUGS, Stan
- Approximate Bayesian computation
- synthetic likelihood (synlik; pomp probe-matching)
- NIMBLE
- automatic differentiation: Template Model Builder (ADMB?)
- spatiotemporal models
- data cloning?

Ellner, Stephen P., Yodit Seifu, and Robert H. Smith. 2002. "Fitting Population Dynamic Models to Time-Series Data by Gradient Matching." *Ecology* 83 (8): 2256–70.

Ionides, E. L., C. Bretó, and A. A. King. 2006. "Inference for Nonlinear Dynamical Systems." *Proceedings of the National Academy of Sciences of the USA* 103 (49): 18438–43. doi:doi:10.1073 pnas.0603181103.

Raue, Andreas, Marcel Schilling, Julie Bachmann, Andrew Matteson, Max Schelke, Daniel Kaschek, Sabine Hug, et al. 2013. "Lessons Learned from Quantitative Dynamical Modeling in Systems Biology." *PLoS ONE* 8 (9): e74335. doi:10.1371/journal.pone.0074335.

Schnute, J. T. 1994. "A General Framework for Developing Sequential Fisheries Models." *Canadian Journal of Fisheries and Aquatic Sciences* 51: 1676–88.