# ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
## ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ

## Σεμινάριο
# Latent Gaussian models with R-INLA
13 Ιανουαρίου 2012
Οικονομικό Πανεπιστήμιο Αθηνών
*Κτίριο Ευελπίδων 47[Α] & Λευκάδος 33, 6[ος] όροφος, Αίθουσα 609*

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**Abstract**

In these lectures, I will discuss approximate Bayesian inference for a class of models named `latent Gaussian models' (LGM). LGM's are perhaps the most commonly used class of models in statistical applications. It includes, among others, most of (generalized) linear models, (generalized) additive models, smoothing spline models, state space models, semiparametric regression, spatial and spatiotemporal models, log-Gaussian Cox processes and geostatistical and geoadditive models.

The concept of LGM is intended for the modeling stage, but turns out to be extremely useful when doing inference as we can treat models listed above in a unified way and using the *same* algorithm and software tool. Our approach to (approximate) Bayesian inference, is to use integrated nested Laplace approximations (INLA). Using this new tool, we can directly compute very accurate approximations to the posterior marginals. The main benefit of these approximations is computational: where Markov chain Monte Carlo algorithms need hours or days to run, our approximations provide more precise estimates in seconds or minutes.
Another advantage with our approach is its generality, which makes it possible to perform Bayesian analysis in an automatic, streamlined way, and to compute model comparison criteria and various predictive measures so that models can be compared and the model under study can be challenged.
In these lectures I will introduce the required background and theory for understanding INLA, including details on Gaussian Markov random fields and fast computations of those using sparse matrix algorithms. I will end these lectures illustrating INLA on a range of examples in R (see www.r-inla.org).

## Πληροφορίες

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| **Διοργάνωση:** | Τμήμα Στατιστικής, Οικονομικό Πανεπιστήμιο Αθηνών (ΟΠΑ) |
| **Αίθουσα:** | Ευελπίδων 47Α & Λευκάδος, 6ος όροφος, Αίθουσα 609 |
| **Κόστος συμμετοχής:** | Δωρεάν, αλλά η επιλογή θα γίνει με **αυστηρή σειρά προτεραιότητας.** |
| **Συμμετοχή:** | Οι δηλώσεις συμμετοχής γίνονται τηλεφωνικά ή μέσω e-mail στη Γραμματεία Μεταπτυχιακού Στατιστικής (e-mail: masterst@aueb.gr, τηλ: 210-8203681) |

## Πρόγραμμα Σεμιναρίου

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|---|---|
| 09:00 - 12:00 | Διαλέξεις |
| 12:00 - 14:00 | *Διάλειμμα* |
| 14:00 - 17:00 | Διαλέξεις |