



WORKSHOPS

5TH OF JULY 2016

Montpellier – France
SupAgro Campus, 2 place Viala
43°37'08.00" N
03°51'20.96" E

« The spatial analysis of accuracy using geographically weighted frameworks »

by Prof. Alexis Comber (Leeds Univ., UK) and Dr. Paul Harris (Rothamsted Research, UK)

« Bayesian calibration and spatial uncertainty propagation »

by Prof. Gerard B.M. Heuvelink (Wageningen Univ., NL) and Prof. Sytze de Bruin (Wageningen Univ., NL)

« Positional accuracy assessment and control »

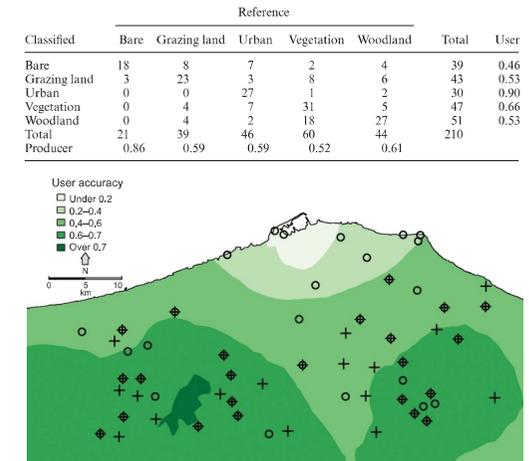
by Prof. F.J. Ariza-López (Jaén Univ.) & Prof. J. Rodríguez-Avi (Jaén Univ.)

Registrations before 15th of june at <https://colloque.inra.fr/spatial-accuracy2016/>

« The spatial analysis of accuracy using geographically weighted frameworks »

Tutors : Prof. Alexis Comber (Leeds Univ., UK) and Dr. Paul Harris (Rothamsted Research, UK)

This workshop focuses on developing spatially explicit approaches for quantifying and reporting the accuracy of remote sensing (RS) data. The workshop will demonstrate and apply a geographically weighted (GW) frameworks to analyse data collected under a land cover / land use validation exercise to evaluate crisp (Boolean) and soft (Fuzzy) accuracies and will demonstrate the wider use of the GW framework. The context for this workshop is failure of standard methods of reporting accuracy based on the correspondence matrix to account for the well-known spatial autocorrelation of errors in RS data. The *global* measures of accuracy (User, Producer and Overall accuracies, kappa etc) are aspatial – they tell you nothing about the *local* spatial distribution accuracy ('spatial accuracy'). Recent work by the workshop organisers has developed methods for generating such local measures from data collected under a standard validation exercise. These analyses transform validation data in correspondence table to mapped outputs, as in the examples in the figure (right: a confusion matrix and a map Grazing Land User accuracy from Comber (2013). Other visualisations and representations of local accuracy measures are possible, many of which



Program:

09h15-10h45 Introduction and Computer practical
 10h45-11h00 Coffee break
 11h00-12h30 GW framework and computer practical
 12h30-14h00 Lunch break
 14h00-15h30 Mapping spatial accuracy and computer practical
 15h30-15h45 Coffee break
 15h45-17h15 Additional materials and computer practical support

Pre-requisite: A computer with R installed. No experience of R needed but we suggest that people new to R work through the Owen Guide up to page 28 (<https://cran.r-project.org/doc/contrib/Owen-TheRGuide.pdf>).

Bibliography: Comber A.J., (2013). Geographically weighted methods for estimating local surfaces of overall, user and producer accuracies. *Remote Sensing Letters*, 4(4): 373-380

Workshop Material: Data and code will be provided. 

Registration: Before 15th of June, at <https://colloque.inra.fr/spatial-accuracy2016/>

Costs:

Standard: (VAT included) €72.00
 Student : (VAT included) €36.00

Location: Room «Zenith »,
 La Gaillarde Campus, SupAgro school center, 2,
 Place Viala, Montpellier-France

Attendants: 40 (max). Participants to the Spatial Accuracy conference will be prioritized

Registrations before 15th of june at <https://colloque.inra.fr/spatial-accuracy2016/>

« Bayesian calibration and spatial uncertainty propagation »

Tutors : Prof. Gerard B.M. Heuvelink (Wageningen Univ., NL) and Prof. Sytze de Bruin (Wageningen Univ., NL)

Input data for spatial environmental models may have been measured in the field or laboratory, derived from remotely sensed imagery or obtained from expert elicitation. Data are also often digitised, interpolated, classified or generalised prior to submission to a model. In all these cases errors are introduced. This one-day workshop begins with a review of statistical techniques used to analyse how input errors propagate through spatial environmental models. This part also includes a computer practical in which participants analyse how uncertainties in interpolated soil properties propagate through a regression model. But input error is not the only source of uncertainty. The model itself may be in error as well, and indeed in many practical situations this may be the main source of uncertainty. Model uncertainty can be captured by including an additive noise term and by letting the model parameters become uncertain. This boils down to characterising the parameters by probability distributions. The main challenge then is to come up with realistic parametrisations of these probability distributions, and since these are case-dependent they must be derived by comparing the model predictions with independent observations of the model outputs. An attractive method for that which is gaining much popularity recently is Bayesian calibration. The second part of the workshop explains the theory of Bayesian calibration and integrates it with input uncertainty propagation. During the computer practical the theory is applied to the same regression model, but now also taking uncertainty in the model parameters into account. Results are compared with an analytical approach as a means of verification.

Program:

09h15-10h45 Lecture spatial uncertainty propagation
10h45-11h00 Coffee break
11h00-12h30 Computer practical spatial uncertainty propagation
12h30-14h00 Lunch break
14h00-15h30 Lecture Bayesian calibration
15h30-15h45 Coffee break
15h45-17h15 Computer practical Bayesian calibration

Pre-requisite: The computer practicals are done in the R language. A brief introduction to R and ready-made scripts are provided. Experience with R is not a prerequisite.

Bibliography: Kennedy, M.C., O'Hagan, A., 2002. Bayesian calibration of computer models. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 63(3), 425–464.

Workshop Material: Lecture slides , Computer lab instructions with scripts and dataset , Selection of key publications



Registration: Before **15th of June**, at <https://colloque.inra.fr/spatial-accuracy2016/>

Costs:

Standard: (VAT included) €72.00
Student : (VAT included) €36.00

Location: Room «Grand Louvre »,
La Gaillarde Campus, SupAgro school center, 2,
Place Viala, Montpellier-France

Attendants: 10 (min) to 24 (max).
Participants to the Spatial Accuracy conference
will be prioritized

Registrations before 15th of June at <https://colloque.inra.fr/spatial-accuracy2016/>

« Positional accuracy assessment and control »

Tutors : Prof. F.J. Ariza-López (Jaén Univ.) & Prof. J. Rodríguez-Avi (Jaén Univ.)

Positional quality is one of the most desirable characteristic of spatial data and it is determined by positional accuracy, which is one of the quantitative quality elements of geographic information, as stated in the new International Standard 19157. Positional accuracy is a matter of renewed interest because of the capabilities offered by the Global Navigation Satellite System (GNSS) and the need of a greater spatial interoperability for supporting the Spatial Data Infrastructures. Different positional behaviors of geographic data sets mean the existence of an inter-product positional distortion and a barrier to interoperation. This barrier exists not only for the positional and geometric aspects, but also for thematic issues, which are greatly affected by position. The goal of this half-day workshop is to perform a critical review of in-use positional accuracy assessment methods. The workshop begins distinguishing between estimation and control and with a revision of some positional accuracy assessment methods and uncertainty models being applied for positional errors. Half of the work shop will be devoted to practical exercises (hypothesis testing, application of some positional accuracy assessment methods, and reporting results). This workshop is fundamentally applied and, in consequence, the practical exercises will run jointly with the lectures.

Program:

14h00-15h30 Lecture and exercises (I)
15h30-15h45 Coffee break
15h45-17h15 Lecture and exercises (II)

Pre-requisite: Exercises will be resolved using R. Scripts will be provided. Experience with R is not a prerequisite, but desirable.

Bibliography: Selection of key publications will be provided.

Workshop Material: Written material and lecture slides, exercises instructions, example data and example scripts in R.



Registration: Before **15th of June**, at <https://colloque.inra.fr/spatial-accuracy2016/>

Costs:

Standard: (VAT included) **€36.00**
Student: (VAT included) **€18.00**

Location: Room «César »,
La Gaillarde Campus, SupAgro school center, 2,
Place Viala, Montpellier-France

Attendants: **10** (min) to **15** (max).
Participants to the Spatial Accuracy conference
will be prioritized

Registrations before 15th of june at <https://colloque.inra.fr/spatial-accuracy2016/>