



## Tutorial: Writing better requirements with EARS+ (T02)

**Monday, September 12, 2016 (Full-day)**

<http://re16.org/pages/conference/tutorials/#T02>

Easy Approach to Requirements Syntax (EARS) has been shown to drastically reduce or even eliminate the main problems typically associated with natural language (NL) requirements and is widely used in academia and in a range of industries. The enhanced EARS+ notation allows requirements authors to add more detail where necessary, whilst maintaining the readability of textual requirements.

Black box system requirements are usually written in unconstrained NL, which is inherently imprecise. During system development, problems in system requirements often propagate to lower levels. This creates unnecessary volatility and risk, which impact programme schedule and cost. To mitigate this problem, there is a need to provide simple, practical guidance for authors of NL requirements. EARS is a notation for authoring NL requirements through the application of a template with an underlying ruleset. EARS has proved popular with practitioners because it is lightweight, there is little training overhead, no specialist tool is required and the resultant requirements are easy to read. EARS is especially effective for requirements authors who have to write requirements in English, but whose first language is not English.

In practice, requirements authoring is usually an iterative process; first-pass requirements can be quite a simple description of required system behaviour, whilst subsequent iterations are used to add detail. Simple EARS is an effective mechanism for the expression of simple requirements, but does not adequately define precise, rigorous requirements. To address these shortcomings, the enhanced EARS+ template has been developed. EARS+ provides a mechanism to vary the level of detail in NL requirements during iterative requirements authoring. The requirement author can add clauses such as stakeholder, action and object, which have defined syntax. This produces a precise description of the required system behaviour. The practitioner can choose which clauses to apply, thereby tailoring each requirement to the appropriate level of detail, whilst maintaining the readability of NL.

This interactive tutorial will introduce the EARS+ approach, illustrate worked examples of both simple and detailed requirements and discuss the benefits of adopting the approach. The afternoon session will allow participants to work on real requirements from their own projects, with support. Participants will leave with a working knowledge of EARS+, having already applied it to their own requirements.



### **Alistair Mavin**

Rolls-Royce PLC, United Kingdom

Alistair Mavin (Mav) is a requirements specialist at Rolls-Royce PLC based in Derby, UK and has carried out systems engineering and requirements engineering projects in a range of industries including defence, aerospace, rail and automotive. He is the lead author of the EARS+ notation and has experience in the development and delivery of requirements engineering training and in innovation and creativity support. Mav has published many papers on requirements and systems engineering, was Industry Chair for RE13 and Industry Laboratory Chair for RE14, is a member of the “RE” conference series Industry Committee, a member of the British Computer Society's (BCS) Requirements Engineering Specialist Group (RESG) committee and is a chartered engineer.



### **Sabine Teufl**

Fortiss GmbH, Germany

Sabine Teufl (Dipl.-Math. oec. (Univ.)) is a staff researcher in the field of requirements engineering at the Technical University Munich, Germany. In her research, she focuses on tooling-aspects of model-based requirements engineering. She applies EARS in the step-wise transition of textual requirements to formal models. In her research projects she has worked with companies in the field of rail automation, automotive, aerospace, cloud computing and insurance. Sabine has experience in industry, undertaking requirements engineering as an optimization software specialist for production planning in the process industry and as an IT consultant for individual business information software. She has authored and co-authored several papers about requirements engineering.