

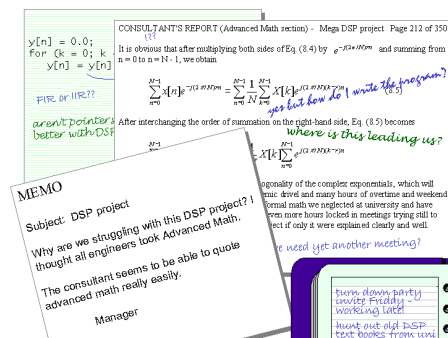
Working with DSP

DSP foundation series

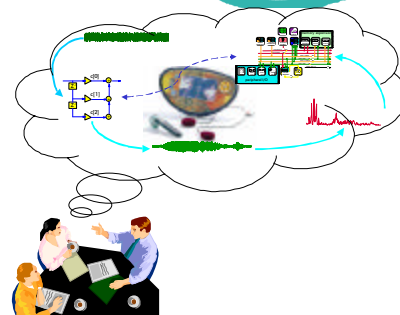
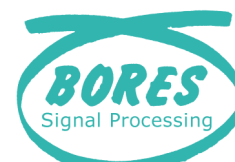
Benefits

Get started quicker and work more productively, with clarity and understanding, thanks to the insights offered by this 'foundation' seminar series.

DSP lets you build better, cheaper, more robust designs: but there is a lot to learn and it is often hidden behind academic mathematics. With the 'DSP foundation' series of seminars you will learn the 'why, what and how' of DSP - and how to apply that knowledge in making well-informed design choices.



Academic dream...



...to practical reality

Contents

In this 3-day series of seminars we explain and clarify why, when and how to apply DSP in real practical situations.

The series is unique in offering real insights and depth of understanding without getting bogged down in unnecessary formal mathematical proofs and derivations.

Each seminar in the series takes a very practical approach, considering from the outset factors such as computational load and the limitations imposed by implementation on real hardware.

Introduction to DSP

In this seminar we explain DSP including its advantages, applications and limitations. We offer real understanding of the practice and limitations of converting analog to digital signals; principles and applications of correlation and convolution; frequency spectrum analysis and the Fourier Transform; basics of digital filters and their application; and an initial introduction to digital filters and their design.

- Background to DSP
- Where is DSP best used?
- Reasons to consider a DSP solution
- DSP basics
- Sampled data systems
- Aliasing and antialiasing
- Why what you see isn't what you thought
- Reconstruction
- Practical limitations
- Frequency and amplitude resolution
- The neglected effects of bad timing
- Quantization noise
- Correlation and convolution
- Frequency analysis
- Fourier transforms and spectral analysis
- Fourier transform limitations
- Frequency 'leakage'
- Windowing
- Filtering

FIR digital filters

This seminar describes and explains how FIR digital filters are used, and also gives very clear and practical guidance in how to implement them efficiently on DSP hardware. We take the view that the aim is an efficient implementation, and show how this aim affects design choices throughout: this focus on implementation is a key feature of our presentation.

- FIR filter basics
- Analysis of FIR filters
- Frequency and impulse responses
- The window design method
- Optimization design methods
- The Parks-McLellan equiripple design
- Practical limitations of FIR filters
- DSP processors
- FIR programming in C
- FIR programming for DSP assembler

IIR digital filters

In this very practically-oriented seminar we examine the reasons why IIR filters fail so often and so catastrophically when implemented on real DSP hardware. We focus on the practical limitations and compromises that are forced on implementers by limited-precision hardware, and show useful practical ways to avoid the common pitfalls.

- IIR filter basics
- Analysis of FIR filters
- Frequency and impulse responses
- IIR filter design
- The z transform and the z domain
- Poles, zeroes and filter response
- Impulse invariant and bilinear designs
- IIR filter programming
- Finite precision implementations
- The problem of quantized noise feedback
- Design workarounds and structures
- How to group and order IIR sections
- Debunking nonsense

Time and arrangements

The 'DSP foundation' 3-day seminar series gives a thorough grounding in DSP including fundamentals, FIR filters and IIR filters. It is presented 'on-site' by arrangement - the material can be adapted if you have specific needs (at extra cost). We recommend it be followed as a series, but individual 1-day seminars can be taken by arrangement if desired.

- on-site by arrangement
- contact: Chris Bore
- email: chris@bores.com

DSP 'foundation' series

- 3-day seminar series
- £ 990 (€1,650; \$1,980) per person
- arrangements as above

Introduction to DSP seminar

- 1-day seminar presentation
- £330 (€550, \$660) per person
- arrangements as above

To book or find out more

Call us by 'phone or send email to book or to ask questions.

- contact: Chris Bore
- 'phone: +44 (0)1483 740138
- mobile: +44 (0)7793 732293
- email: chris@bores.com

DSP foundation seminars

The 'DSP foundation' is a 3-day series of seminars designed to give a thorough understanding of DSP including FIR and IIR filtering. The series can be followed as a 3-day session or as separate 1-day sessions, by arrangement.

- Introduction to DSP
- FIR digital filters
- IIR digital filters