"Embedded Day"
May 25

MALMÖ SWEDEN ER 2012

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Test-Driven Development for Embedded C/C++
James Grenning
(Tutorial, 3 hours)

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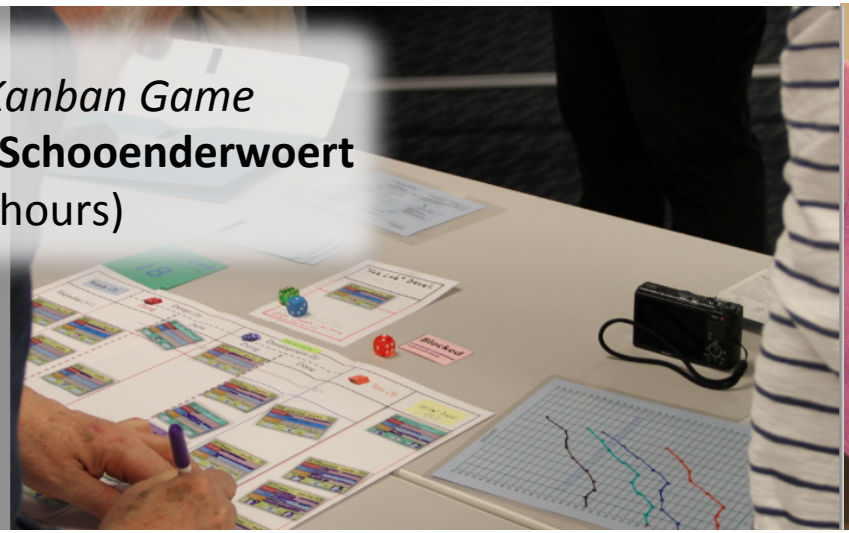
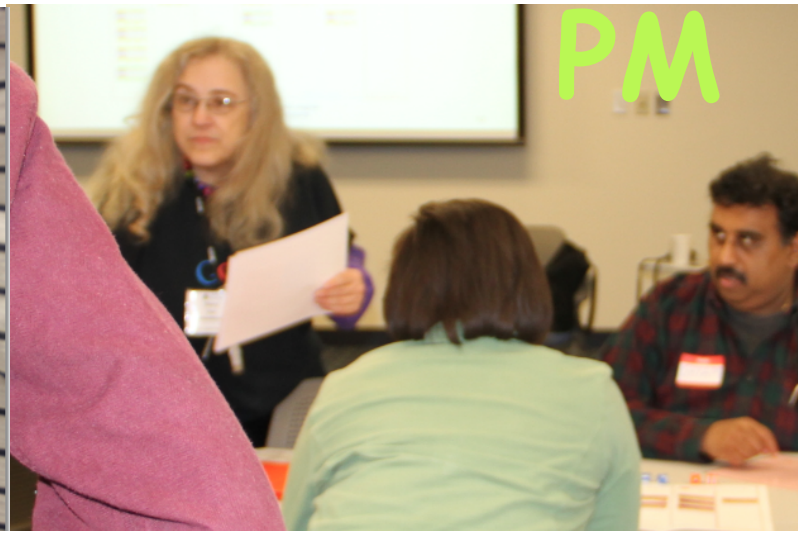


Hardware Kanban Game
Nancy Van Schooenderwoert
(Tutorial, 3 hours)



Test-Driven Development for Embedded C/C++

James Grenning (Tutorial, 3 hours) Friday 8:30

Test-Driven Development is the core of the XP technical practices. With TDD, programmers get instant feedback that their code does what they intend. Rumor has it that TDD cannot be used for developing C, let alone embedded C. The rumor is wrong! TDD can be used effectively for all forms of C. In this tutorial attendees get first-hand experience at TDD, writing well tested code in the challenging world of C. Attendees see how to break dependencies on the target execution environment enabling embedded code to be effectively test-driven. You will see how TDD helps to prevent many bugs and memory leaks from ever making the bug list. We'll use CppUTest, an open source test harness, is used to collect, organize and automate C++ unit tests.

Many of the challenges in embedded development stem from the target hardware bottleneck. The bottleneck slows progress of the embedded software due to non-existent or buggy hardware, and the inefficiencies of cross-platform development. The tutorial shows how to effectively use TDD and object oriented design techniques to overcome the target hardware bottleneck.

Bring your laptop or pair with one of the other attendees. We'll help you get ready at the tutorial, but it would be best if you did some setup before. Please register at www.renaissancesofteware.net using course code XP2012. You will find computer and setup instructions under Resources in Conference Attendee Extras.

Audience: This tutorial is designed for embedded software developers, technical leaders, software architects, firmware developers. They should attend to see how this valuable development practice is used to create high-quality embedded software at a predictable pace. If you program in C or C++, but not embedded, come anyway. No embedded experience necessary.

Hardware Kanban Game

Nancy Van Schooenderwoert (Tutorial, 3 hours) Friday 13:00

Hardware development work has a physical aspect that makes controlling the flow especially difficult, such as long-lead items, deep specializations among team members, and having outside vendors build custom components.

For these reasons hardware development work is different from software development and some say that's why Agile methods cannot work for hardware development. This is incorrect. Agile methods are compatible with Lean queueing theory: By dividing the work stream into chunks, you can achieve higher throughput for the same amount of labor if you reduce the amount of work-in-progress.

Sound incredible? It **is** counter-intuitive. That's why simulation is such a powerful way to explore the behavior of a hardware development Kanban system. Nancy has designed a version of the "getKanban" software board game to model hardware development workflow. As a player, you can work in your specialty or help in another skill, though you are less productive there. You can change task priorities, expedite key stories, or reduce 'technical debt', but you must obey the WIP (work in progress) limits!

You'll see how the Kanban rules drive behaviors that you never would have expected by analysis alone. The game lets you live the action and make the day-to-day decisions. Participants track daily progress using a Control Chart, a Cumulative Flow Diagram, and Financial Summary chart. The effect of your choices such as increase queue sizes, reduce work-in-progress limits, expedite some work – are seen graphically in the charts. This is a very engaging way to experience core lean ideas.

Audience: Technical leads (both hardware and software), project managers, product managers, functional managers, analysts, and development team members.