Automation Techniques for Post-silicon Debug of Timing Failures

Date: August 18, 2011
Time: 12:00pm - 1:00pm
Speaker: Dr. Azadeh Davoodi
Agenda: Informal networking will begin at 11:30am.
Presentation will begin at 12:00pm.
Location: Promega BioPharmaceutical Technology Center
5445 E Cheryl Pkwy, Room Number: 122
Madison, WI 53711
Menu: Lunch meal provided: $5 for IEEE members, $10 for non-members, free for students.
RSVP: Deadline: August 15. Go to http://meetings.vtools.ieee.org/meeting_view/list_meeting/7601
to register. Please send questions or difficulties to Mark Vincent at mvincent@ecw.org.

Non-member guests are always welcome!

Abstract

The complexity of modern electronic systems has made their post-fabrication validation and debug to become a cumbersome process. At this stage, a few fabricated chips are tested for having a correct functionality in order to diagnose and fix the "bugs" which escaped the design stage. This debug process has become time-consuming and expensive due to the costs of the necessary equipment, the number of improved re-fabrications or "silicon re-spin", the use of manual techniques, and the complicated nature of bugs in nano-scale fabrication technologies. Consequently, time-to-market and profit are directly at stake for many sectors of the electronic industry. One of the most challenging tasks in post-silicon validation is debugging for timing failures. Timing failures happen when a malfunction is observed in a chip, only because it is running at a certain speed. The malfunction disappears if the chip runs in a speed lower than what it is designed for but that means either the chip has to be thrown away or sold for a lower price. Debugging for timing failures is cumbersome because of the lack of observability and limitation to a chip interface of only a few thousand I/O pins to reason about billions of nano-scale components. Furthermore, timing failures may be caused by factors such as manufacturing-induced variations and transient fluctuations in the power-delivery network on the chip which further complicate the debug process for nano-scale fabrication technologies. In this talk I will give an overview of our ongoing research towards automation of the debug process for timing failures. I will introduce a number of ways to increase the "timing observability" inside the chip and show how they can be used to accelerate the debug process.

Biography

Azadeh Davoodi has been an Assistant Professor of Electrical and Computer Engineering at the University of Wisconsin Madison since Fall 2006. She received her PhD and MS degrees both in Electrical and Computer Engineering from the University of Maryland College Park, and her BS degree in Electrical and Computer Engineering from the University of Tehran Iran. Her research interest is in the area of Electronic Design Automation of Integrated Circuits. Azadeh is recipient of a 2011 NSF CAREER award.

IEEE Entrepreneurs & Consultants Network, Madison Networking Meeting

Date: August 4, 2011
Time: 12:00pm to 1:00pm
Purpose: Officer's Meeting.
Location: Madison Area Technical College (MATC West Campus)
302 S. Gammon Road (Across from West Towne Mall)
Madison, WI 53717 ... Telephone: 608-246-6100
Parking: Open parking, so come early to get a closer spot.
Process: Members are encouraged to make introductions, describe endeavors, and make request for: contacts in target companies, needs, resources. Bring your elevator speech and rolodex!
RSVP: Tim Chapman (PrettyGoodGUIs@TrueNym.NET)

Storing Your Life "Consumer Digital Storage — Personal, Shared, Hierarchical and Virtual"

Date: September 1, 2011
Time: 12:00pm - 1:00pm
Speaker: Tom Coughlin, President, Coughlin Associates
Agenda: Informal networking will begin at 11:30am.
            Presentation will begin at 12:00pm.
Location: Rocky Rococo's Pizza
            7952 Tree Lane (Beltline Hwy. at Mineral Pt. Rd.)
            Madison, WI 53717 … telephone: 608-829-1444
Menu: Lunch meal provided: $5 for IEEE members, $10 for non-members, free for students.
RSVP: Deadline: August 29. Go to http://meetings.vtools.ieee.org/meeting_view/list_meeting/7603
            to register. Please send questions or difficulties to Mark Vincent at mvincent@ecw.org.

Non-member guests are always welcome!

Abstract

This presentation discusses the drivers for consumer digital storage, the different mobile and static usage models for digital storage in consumer devices and the resulting consumer storage hierarchy. Important characteristics of consumer storage devices are shown and guidelines are given for how digital storage should be designed in consumer devices. Demand for higher resolution content and for capturing ever greater details of the life of family members will drive increases in commercial as well as personal content storage demand. Sharing of content within a home or over the Internet creates much greater demand for storage since a shared file can be multiplied many times through network sharing. Implementation of a virtualized integrated storage utility into most homes with appropriate ease of use, suitable for consumers, will benefit customers by providing greater access to data as well as enhanced content protection using local as well as remote storage.

Biography

Tom Coughlin, President, Coughlin Associates is a storage analyst and consultant. He has over 30 years in the data storage industry with multiple engineering and management positions at high profile companies. He has many publications and six patents to his credit. Tom is the author of Digital Storage in Consumer Electronics: The Essential Guide, Newnes Press, March 2008. Coughlin Associates provides market and technology analysis (including reports on several digital storage technologies and applications and a newsletter) as well as Data Storage Technical Consulting services. Tom is active with SMPTE, IDEMA, SNIA, the IEEE Magnetics Society, IEEE CE Society (Adcom member, TPC member, Associate Editor and VP Operations and Planning), and other professional organizations. Tom is the founder and organizer of the Annual Storage Visions Conference (www.storagevisions.com), a partner to the annual Consumer Electronics Show as well as the Creative Storage Conference held before the NAB show (www.creativestorage.org). Tom has also been the chairman of the annual Flash Memory Summit. He received a B.S. in Physics and an M.S.E.E. from the University of Minnesota (Minneapolis) and a PhD in Electrical Engineering from Shinshu University in Nagano, Japan.

IEEE Entrepreneurs & Consultants Network, Madison Networking Meeting

Date: September 1, 2011
Time: 12:00pm to 1:00pm
Purpose: Officer's Meeting.
Location: Madison Area Technical College (MATC West Campus)
            302 S. Gammon Road (Across from West Towne Mall)
            Madison, WI 53717 ... Telephone: 608-246-6100
Parking: Open parking, so come early to get a closer spot.
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            for: contacts in target companies, needs, resources. Bring your elevator speech and rolodex!
RSVP: Tim Chapman (PrettyGoodGUIs@TrueNym.NET)

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Monthly Section Meetings

The third Thursday of Jan.-May and Sep.-Dec. is reserved for a meeting to provide recent research, developments, trends and/or innovations in one of our membership's technical areas.

Section Meeting Schedule for 2011

(schedule subject to change)

(past) **January 19,** Wind Turbine Generators.

(past) **January 20,** Capitol Heat & Power Plant Rebuild Project.

(past) **February 17,** Tesla Coil Design and Construction ... live demo!!

(past) **March 17,** Privacy of Electronic Health Information.

(past) **April 12,** 21st Century Electric Machines

(past) **May 19**, SADT/IDEF0: Augmenting UML, Agile, and Usability Engineering

August 18, New strategies for debugging electronics

September 1, Consumer Digital Storage: Personal, Shared, Hierarchical, Virtual

October 28, Distinguished Lecturer on Signal Processing: Dr. Patrick Flandrin on time-frequency energy distributions .

November 17, TQM Experiences in the High Precision Instrumentation Industry. Tour the Bruker, AXS facility!!

December 15, Voting for 2012 Officers

Monthly Networking Meetings

The first Thursday of every month is reserved for a meeting to provide networking opportunities for members who are consultants or entrepreneurs. Bring your elevator speech and rolodex!

Networking Meeting Schedule for 2011

(schedule subject to change)

(past) **January 3,** Kickoff meeting for 2011.

(past) **March 3,** SBIR Process and Panel.

(past) **April 7,** Sector67 – Overview of Madison innovation environment.

August 4, Working on the Network.

October 6, Telepresence.

December 1, IEEE Tools for Self Promotion.

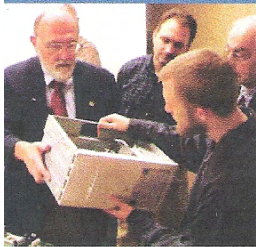Join the Madison Section Network at **Linked in**®

Section Notes

We encourage our Section members to bring guests to our monthly meetings. We also ask that Section members consider suggesting becoming a member of the IEEE to their colleagues. Our section is one of roughly a dozen who have celebrated 100 years of continued service to IEEE members. We are proud of our service to the Engineering community of Southern Wisconsin, and invite engineering professionals in our area to any and all of our events!

Our Section runs on the generosity of our Members in the donation of their time, skills and efforts. We invite anyone in our Section to consider becoming a Section Officer in 2012. Please send your thoughts and considerations about possibly serving on the Board of Directors for our section to this year's chairman: David Marca, dmarca@openprocess.com. Thank you!

IEEE Madison Section Sponsors
We thank the following sponsors for their support of the IEEE Madison Section, and for the valuable opportunities and services they provide to the Section and to its membership:

Madison Section Newsletter

Find the online archive at http://ieee-msn.truenym.net/news.html

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IEEE Membership Level Upgrades

Those interested in upgrading their IEEE membership level should send their resumes or other information showing five years of significant performance in an IEEE-designated field to Charles J Gervasi (cj@cgervasi.com). Madison Section Board will attempt to find Senior IEEE members knowledgeable in the applicant's area of practice who may be able to provide references. You are invited to attend the informal networking portion of the monthly Section meetings (starting at 11:30am) to meet the Section Board members and discuss intentions.

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