

ASYNCHRONOUS RESEARCH CENTER

Portland State University

Subject: Seminar Announcement – GasP Circuits that Work
To: Students
Date: August 13, 2010
From: Ivan Sutherland
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I plan to offer a research seminar during the Fall Quarter 2010. Students and I will explore together the behavior of a number of GasP circuits known to work. Students will simulate the circuits provided using the SPICE simulation tool. Students will interpret the results of their simulations to understand circuit behavior.

This class will help students gain familiarity with a novel family of asynchronous digital circuits. Because we will explore novel circuits the seminar will help students identify research projects worthy of further effort. Each student will do a simulation each week and report on it in class.

The GasP family of control circuits will be central to our explorations. GasP circuits use only a handful of logic elements to provide self-timed control of on-chip computer networks; because they are simple they are also very fast. Together we will explore the surprisingly rich properties of such circuits with emphasis on creating hitherto unexplored configurations. Subjects include: Forward and Reverse Latency, Canopy Diagrams, Data Kiting and applications of GasP to networks, computation, and memories. Research opportunities abound.

Students wishing to enroll should be familiar with digital logic and have experience with SPICE. We will use Logical Effort to guide our designs because it offers a simple way to design fast circuits. Students who need assistance in Logical Effort will be able to gain understanding in class. Grades will be based on participation in weekly projects and class discussion, but as always, what we learn will depend on how you choose to participate.

I hope to share with you my enthusiasm for the simple beauty of logic circuits, the rich potential that even simple circuits offer, and the deep satisfaction that comes from creating new ideas. Research should be fun. It's provided me with a lifetime of pleasure. Let us enjoy our time together and create some new knowledge.

Want to know more? The web knows all. Seek "Gasp: A Minimal FIFO Control" and read "Technology and Courage."