

**2003 EDAC KAUFMAN AWARD RECIPIENT:
A. RICHARD NEWTON**

By Aart de Geus

Good evening, Richard, Petra, Neris, Amrita, ladies and gentlemen. It is truly an honor to be taking Rich Newton's place tonight, introducing the 2003 Kaufman Award recipient. For those of you who haven't been to one of these dinners before, Rich has introduced every Kaufman Award recipient since the program began in 1994.

However, Rich won't be the introducer because tonight he is the *recipient*.

Still, Rich was very eager to write tonight's remarks himself, and it was only by using the threat of a Kaufman Award *recall* that I was able to dissuade him. Don't worry, Rich, you can't get the Kaufman award twice, so next year there is a job waiting for you again... Meanwhile, you're all mine!

But this introduction thing is easier said than done. How do you summarize in a few words what took about fifty years to achieve? How do you balance the reporting on a list of accomplishments that keeps growing and growing with every new person I talk to against the need to get out of here before midnight? But most importantly, what captures in one word who Rich is? What characterizes the *essence* of the person sitting here at the honorary table tonight?

Suddenly, it hit me. If you recall chemistry from your college days, you know that chemical reactions can be triggered or greatly accelerated by something called "catalysts." Amazingly, only

minute amounts of catalytic material, typically platinum, dramatically impact a chemical process. The catalyst itself remains unaffected and can be reused over and over again. For those of you in the room that speak fluent classical Greek, you will recognize immediately that the word catalyst is derived from kata, meaning “to dissolve,” and luein, meaning “to set free.”

This description fits Richard perfectly because he has been such an unparalleled agent of change in our industry and has stimulated and set so many ideas free. Guided by an innate vision of what will be important next, Rich somehow manages to be in proximity of the next big thing when it starts, and he often is the one that catalyzes the new direction into being. He does this with great enthusiasm and can move from one great idea to the next at alarming speed. In fact, if anything, he has already moved on to the next idea when the rest of us are just catching up on the last one and are toiling away in tedious implementation.

Thus, not surprisingly, industry catalysts and visionaries are not always appreciated at the moment of their contribution. More than once, Rich has attracted flak when formulating a far-out idea or novel concept. By the time the ideas have truly become reality, sometimes years later, everybody of course thinks that the concepts were totally obvious in the first place and “what’s the big deal?” True visionaries, though, recognize the obvious before it *is* obvious and catalyze the happening before it happens! In EDA, Rich is that person for our field.

Rich spreads his catalytic powers in our industry with a level of energy and enthusiasm that is matched by few.

This enthusiasm is not new for Rich. Growing up in Australia, he moved quickly from one exciting hobby to another. His early interest in electronics was awakened by his dad, who was an engineer. As Rich’s brother Mike says: “If Dad were alive today,

he would probably see in Rich everything that he himself always wanted to be.”

The projects that Rich took on were big ones, limited only by the amount of equipment and electric wire he could drum up. His entire family recalls vividly how he transformed the roof of their house into an aerial antenna, which he used as a radio telescope to track satellites.

I’m not sure what happened when the Australian version of the FBI came calling to see what Rich was *really* up to. But perhaps they were kept out by the security system that he had installed around the house, complete with trip wires and alarms.

When his focus wandered to photography, portions of the house were immediately converted to darkroom status. Still today I can hear in his younger brother’s voice the silent admiration for Rich in his fascinating endeavors.

Many of these exploits would swiftly qualify him for the title of techno-nerd but for the fact that he really isn’t one! On the contrary, Rich is a well-connected, enormously social person who loves to be with others. Already as an adolescent, he was a born leader and was elected head prefect of his high school (a sort of school captain). He was very active in athletics and broke the long jump record at his school, which after all these years still stands! In addition, he played Australian-rules football in school. In case you’re not familiar with Australian-rules football, it’s a form of rugby that can be explained in two simple words: “very rough.”

No matter what Rich was up to, though, his brother confirmed that he always had a very strong drive to play by the rules. What Mike was really pointing to was Rich’s unwavering sense of fairness, integrity, and loyalty that anyone who knows him has witnessed. You could always count on Rich. Collecting comments about him,

I was struck by the number of people that consider him a close friend.

Kurt Keutzer, who is now a professor at UC Berkeley, describes especially well what it's like to have Rich as a friend:

Kurt said: "Richard is an extraordinary friend. When I was 18 years old, I read Jack Kerouac's novel, "On the Road." Admiring Kerouac's friendships with Neal Cassidy, Allen Ginsburg, and Gary Snyder, I asked my mother: 'Mom, why don't I have friends like Jack Kerouac had?' My mother wisely responded: 'Well, are you a friend like Jack Kerouac?'"

"Over the years," Kurt continued, "I've thought a lot about the qualities of friendship: honesty but sensitivity; integrity but loyalty; and most of all, the irrational willingness to go the extra mile. Richard demonstrates all of those. He is indeed a friend 'just like Jack Kerouac.'"

Rich got his Bachelors and Masters of Engineering at the University of Melbourne. When Don Pederson visited the university and found Rich working on interactive simulation, he invited him to come to UC Berkeley to get his doctorate. That event changed Rich's life. Not only did he move to America; suddenly he was immersed in a stimulating environment of academic excellence and found in Don Pederson a mentor who gradually became like a second father to him.

Don, who is a Kaufman Award recipient himself, cannot be here today. Sadly, he is suffering from the later stages of Alzheimer's disease, and it is quite difficult even to communicate with him. Yet two weeks ago, it was possible to ask him about Rich, and he managed to utter just a few words. He said only one sentence that captures it all. He said: "I knew Richard was a star when I met him in Melbourne 30 years ago."

At UC Berkeley Rich quickly became an active member of the simulation gang. In July 1978, he received his Ph.D. His dissertation was called “Splice - A hybrid simulator for the analysis and design of LSI MOS circuits.” I have kept my copy for 25 years, always thinking that it would come in handy for public humiliation someday. That moment has finally arrived tonight.

In all fairness, Hugo de Man another Kaufman Award recipient, stated that Rich was the first to develop hybrid or mixed-mode simulation, and the follow-on dissertation undoubtedly made some very important contributions to that field. But one statement in this book stands out and has become the cornerstone of all simulation dissertations since.

In the abstract, Rich writes that Splice is quote: ”between one and three orders of magnitude faster than a circuit simulation program.” With this sentence, he taught generations to come that by choosing the right set of sample circuits and comparing your work to the slowest possible version of Spice, *you too* have a chance to shine in academia. Indeed, this very sentence has been plagiarized by numerous dissertations on simulation, I must confess, including my own...

In Australia Rich had already been working on simulation, which brought him to the attention of Don. At Berkeley Rich quickly took over the “SPICE guardian” role from Don and drove forward a key set of enhancements to the program. Initially, he was in charge of developing the MOS2 model, then added distortion and noise, and ultimately brought out Spice 3 – or what we in industry call “a new release with major functionality improvements.” (We normally charge for those.)

Although this was done entirely in an academic environment, Rich was essentially managing an industrial-strength set of software

projects with a large number of demanding users and a never-ending list of enhancement requests with an underpaid workforce. Most commercial EDA start-ups fail at this kind of endeavor, but the breadth and impact of Spice still inspires awe today. As a direct result of these efforts, Rich became very well known and established a formidable set of connections that would become the raw material for his “catalytic” impact much later.

His success, not only as a leading technologist, but also as an effective ambassador (and fundraiser) for the EE department was quickly recognized. In 1979 Rich was appointed professor, opening yet another avenue to his talented personality: teaching. Anybody who knows Rich will immediately recognize that he is an outstanding teacher. His enthusiasm is infectious and his energy is overwhelming. It is thus not a surprise to discover that in 1987 he was recognized as the national recipient of the C. Holmes McDonald Outstanding Young Professor award.

Meanwhile his technical contributions did not go unrecognized. I found at least 4 best-paper awards, all dating from his very fertile 1980s. Simultaneously, Rich was an extremely active participant and organizer in all major EDA venues ranging from DAC, EuroDAC, DATE, SASIMI, ASIA DAC, and others to his culminating orchestration of the GigaScale Research Consortium, a program that aligns a number of very competitive universities around a common research direction for EDA.

When asked, though, what he is most proud of, the answer is: “my students.” Be it Srini Devadas, now professor at MIT, Rez Saleh, now at UC Illinois, Bill Lin at UC San Diego, or many of the students that went on to make major contributions in industry, each one comes with a story. The common theme among all of them is that Rich was (and is) always there for them and fundamentally was the one that “catalyzed” them to “go for it” and set their talent free!

Rich’s interests continued to broaden. In typical visionary style, Rich was probably one of the first to recognize the importance of coherent, integrated design representations as central to the next generation of EDA tools. Surrounded by a crew of very bright and, thanks to Rich, very motivated students, folks such as Ken Keller, Jim Kleckner, Mark Bayles, Wendel Baker, and Steve Potter, to name just a few, he built an integrated data model, from which layout, symbolic layout, netlist, libraries, and extension languages developed. A derivative of one extension language became SKILL at SDA, which later became Cadence.

Early on, Rich was a staunch advocate of open standards. He was personally the force that brought about the EDIF interchange format. EDIF was a big deal, and in typical “Rich-catalyst” fashion, he made sure that it was not only “his idea.” Instead, he built a coalition including Motorola and TI as co-sponsors. The

fact that EDIF and EDIF derivatives are still used today is just short of astonishing!

Simultaneously, he foresaw the importance of the Unix open operating system well before Sun Microsystems was born. He swiftly moved all EDA development onto UNIX and orchestrated the systematic distribution of Berkeley EDA software on this platform.

Meanwhile, at National Semiconductor Jim Solomon was interested in picking up some of the tools that Rich and his students developed. Tools with descriptive names such as Oct, VEM, Kick, Hawk, and Squid. Jim, however, as a design manager, worried about using software supported by a bunch of flakey grad students and was hoping that a commercial EDA vendor would emerge to distribute and support the technology.

Jim and his team at National met with Don Pederson, Rich, Alberto Sangiovanni-Vincentelli, and a number of others at UC Berkeley to try to come up with solutions. As Jim said, “Rich was the clear leader of the group, and he forcefully and thoughtfully drove us to the appropriate answers.”

The long and short of all of this is that Jim - depending on the sources - either decided or was talked into forming a commercial entity: Solomon Design Automation, or SDA for short. As you know, SDA later merged with ECAD to become Cadence. The initial core objective was to build an extensible framework on a portable operating system and add a number of layout capabilities that would make it an attractive, but, most importantly, extendable physical design system. Cadence’s customers today still benefit from that early technology.

Rich’s contribution and influence was substantial and most of his students made up the first core team of the company. Rich’s

personal reputation became the drawing card to attract further talent to SDA, and he served as the chair of the Cadence Technical Advisory Committee for a number of years.

At this point I must say a few words about UC Berkeley and its impact on EDA. “Berkeley Inc.” had emerged in the form of a very powerful team made up primarily of Don Pederson, Ernie Kuh, Rich, and Alberto, later amended with the addition of Bob Brayton joining from IBM.

Specifically the “Rich and Alberto” combo though, was an engine of formidable impact. Both are good friends, quick on their feet, deeply technical, and totally competitive.

Alberto tells a descriptive story of the early days: “In the golden days of the CAD group at Berkeley, Rich, I, and our graduate students met on Friday afternoons for pizza and for a particular Aussie-invented sports event: The Boat Race! The Race was between two groups lined up facing each other. Each of the players had in front of him a mug of beer. At the start, the first players would grab the mug and drink it as fast as possible and, after having finished the beer, they would slam the mug on the table, passing the task to the neighboring player on the team. The team finishing their beer mugs first was the winner.

There was an interesting quirk in the game... If you were losing ground, then instead of finishing the beer you would be allowed to take the mug and empty its content over your head!! The game was always played very hard, and Richard's team would consistently win! For two reasons:

1. Richard would anchor the race, and when the mug was in his hands, in about 1 microsecond he would empty it! No way any one on my team could do that!!!

2. Once and only once, we were ahead by one player and even counting the great ability of Richard as the anchor, we would have won!! But the player before Richard that time was Srin Devadas, who being abstemious (which we did not know then), took the mug and emptied it over his head in a matter of seconds. We lost again!!!!

As you can see from this anecdote, the Berkeley “machine” was an outstanding place of higher learning and education. Someone once joked that if Bob Brayton was Engineering, then Rich was Marketing, and Alberto was surely Sales. Although this quip probably does not do justice to all the participants, it is clear though that as a team, they have had enormous impact on EDA. Indeed, the Berkeley trio displayed an ability to work together that is a role model for academia and commercial companies alike.

Rich, as the marketing spirit – and I mean this in a very positive way – had a tremendous perception for the industry impact of EDA, and he quickly grew beyond academia. Following the initial SDA success, he became an active driver in the formation and prosperity of quite a number of companies.

Harvey Jones, my former partner at Synopsys and a long-time colleague of Rich’s, said: “I have had the privilege to work with Richard on five different private companies. Two have gone public, one was sold for a substantial profit, and the other two are very important and exciting prospects for the future. There is no one I would rather collaborate with in the founding of a new design automation venture than Rich. Rich is a scholar, savvy investor, and gentleman all in one package.”

Indeed Rich has played key roles in the birth of SDA, Viewlogic, Synopsys, Pie, Redwood, and Simplex, to name just a few in EDA. On top of that he has been very active with Tensilica, Windriver, Sonics, Lightspeed and many others. He was acting President and CEO of Silicon Light Machines, which was sold to Cypress

Semiconductor, and he was active as a VC partner in the Mayfield Venture Fund and today in the Tallwood Venture Capital Fund.

Within EDA his contributions to SDA/Cadence and to Synopsys stand out. Reflecting on his participation in starting Synopsys, it is really only now that I have come to fully appreciate all Rich has done.

It was probably 1983 or so that on the invitation of Ron Rohrer – also a Kaufman award winner – Rich and Don came to visit General Electric to review our various EDA projects. I remember being in awe of these gentleman then because they had very good questions, but even more so because they also had all the answers to the questions! In other words, they were outstanding consultants! Somehow that visit to GE must have left an impression on Rich as well because speaking at a conference in Japan in '85, Rich stated that “the next big thing was going to be logic synthesis..

A year later, when Rich found out that we were planning to set up a synthesis company, he initially tried to convince Joe Costello to pick up the team. Finding Joe less than receptive at the time, Rich helped us find venture funding via his influence and connections. On our side we had fully realized how influential Rich and Alberto were and welcomed their involvement, although I don't think that at that time I fully appreciated or even understood the breadth, depth and impact of Rich's endeavors. Once the company was started, Rich helped us recruit our first applications engineer, Deirdre Hanford, who today is our Sr VP of Applications Support and arguably one of the three most successful women in EDA, period. Rich was also central in attracting Rick Rudell, the world's foremost expert on synthesis, to Synopsys, and as a board-member, Rich paved the way for innumerable industry contacts.

But the real contributions in my mind are much less tactical and fall in two categories that confirm Rich's catalytic talents: First, before anybody else, Rich not only had the vision of "the big picture," but he also had the flair for the timing, the judgment of the right people, and most importantly the action that he needed to take without most of us even fully noticing. At that moment, he became THE catalyst that made our "synthesis reaction" occur.

Secondly, on a much more personal note, he turned into a friend, mentor, critic, and guide and helped bring out some of the talents that I certainly did not know I had. In the long and at times intense journey that we have had so far, I especially appreciate his trust as he shared some of *his* toughest moments with me. And I am deeply grateful for his unwavering confidence in me when at times I felt close to collapse under the stresses of my job. In moments like those, his support is incredibly motivating and loyal. Similar feelings are shared by Penny Herscher, who Rich helped during her tenure at Simplex. She comments: "Those who have been lucky enough to be mentored by him will resonate with the idea that no matter how you are screwing up, he never stops believing in you."

She also highlighted that Rich in his career has been a staunch supporter of women in technology. Indeed, Richard worked to create the "Women in EDA" program at the Design Automation Conference, and he initiated the Women's Distinguished Lecturer Program at UC Berkeley.

If we classify people in two camps: the people who, when asked whether something can be done, typically say "Yes, if..." and those who say "No, because..." then Rich is the poster-child of the "Yes,if's."

Mel Slater, a long-term executive from Motorola, describes Rich's approach to the world as, quote: "He sees the best and he sees possibilities in everything."

It is this very idealism that makes him THE BEST in the job that he has today. After becoming head of the EE/CS department and doing an outstanding job, Rich, well ahead of schedule, became Dean of the School of Engineering two years ago. Besides a multitude of other tasks, including the never-ending quest for funding, the initiative in which Richard has been able to marry his love of technology to his concern about society has been the formation of CITRIS, the Center for Information Technology Research in the Interest of Society. In CITRIS researchers on four UC campuses, along with industry partners, are developing information technology solutions to large-scale problems that our society faces. That is a mouthful!

But in Rich's own words, he says: "We really are a global community; not just businesses, not just technology; we are one 'family.'" If you believe that people are a net positive, and I do, then technology can and must be used in the interest of society."

The CITRIS research includes the areas of the environment, services to the third world, health care, emergency preparedness, and education, just to name a few.

Kurt Keutzer summarizes all this with uncommon skill by stating: "In short, Richard's talent for innovative thinking is only overshadowed by his industry vision. His industry vision is only overshadowed by his societal concern. His societal concern is only overshadowed by his concern for his friends and family. What an extraordinary fellow!"

The word family just came up. Somewhere between his life on United Airlines and an endless set of presentations and meetings

all over the world, Rich also has a wonderful family. Petra, his thoughtful and very active wife, and two daughters, Neris and Amrita complete the picture.

I am always amazed how kids grasp the fine points of a person so well, as the following interview with Neris, his 10-year-old, illustrates:

Neris, what does your dad do?

He works at a school.

What does he do there?

Silence... Has to go to a lot of meetings where they ask him for money or help with teaching.

Does he give them money?

Yeah but they have to pay it back!

Neris, what about at home, does he fix things?

Yeah, he builds things with electric stuff.

What kind of stuff?

Hesitation ... Flat things with many wires...

You mean chips?

Yeah, like that...

What is his favorite tool?

Screwdrivers,

and he uses his computer all the time, even on weekends.

So he also teaches, right?

Yeah.

Do you think that he is good at it?

Oh, yeah!

How do you know?

The response came right from her heart: "He taught me a lot!"

Neris, I am going to give a speech to your dad. Do you have a message for him?

No, because I tell him that I love him every night!

Of all the comments I received about Richard, the single one that captured best who Richard is for me is how Petra, his wife, summarized him. She simply said: “He has a big heart.” Those are beautiful words. As much as the Kaufman Award recognizes the accomplishments of his mind, what makes Rich the person we love is the impact of his heart.

In our profession, Rich is the ultimate catalyst and in “frequent EDA impact miles” he has reached “platinum status.” As a colleague and friend, though, there is no need for a measure, because we know we can always count on him.

One last comment: I have seen Rich sign his name many times. He writes “A. Richard Newton.” The initial “A” stands for Arthur.

Still, every time I see his name written like that, it seems wrong to me, and I’ve finally figured out why. He is not “*a* Richard Newton”; he is “*THE* Richard Newton.”

So on behalf of Mrs. Kaufman, the EDA Consortium, and all present here tonight, it is my pleasure to award the 2003 EDA Consortium Kaufman Award to THE RICHARD NEWTON!