

Alumni Association



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MESSAGE FROM ARCHIVES CHAIRMAN DON NIELSON



Don Nielson

They say that spring is what you've waited for all winter, an anticipated pleasure. Well, we hope this issue meets that standard because there's a lot going on in our world right now that doesn't. From clinging viruses to contentious villains, we seem to have to search hard for something uplifting beyond the poppies and the citrus and the outreach we can make.

The merits of outreach come to our attention in this issue as alumnus Clay Ross shows how exhilarating it can be to extend a hand. You'll read how his desire to help isolated medical patients led him to qualify to be part of a nationwide association of pilots that flew over 4,000 mercy missions last year at no cost to those they aided. Read why he loves it. It's inspirational!

Read, too, how SRI is still moving frontiers through innovation. One of those frontiers is the desperately needed protection of our digital systems and their associated information. You'll find two examples of SRI's efforts there. One, sponsored and carried out in the US and UK, is an ongoing, revolutionary program to protect digital memory using a combination of software and hardware. The other involves protecting the information we accumulate that is getting so voluminous that we place it in the cloud. This has a particular set of risks, and mitigating them is an area where SRI has great competence.

You will also find an account of a critical antidote to an overdose of opioids, particularly hyper-potent opioids like fentanyl. In a totally different vein, you will see how you can dig a big hole using your hands and not get even your fingernails dirty. After reading the article, be sure to watch the associated video to get the real flavor of SRI's ingenuity. Finally, read how SRI's education talent continues its long journey toward equitable access to education in Appalachia.

In the History Corner, the conflagration in Ukraine prompted my recollection of SRI's important role in the birth of one of the sanctions being used against Russia—barring it from SWIFT. From its modest beginnings, SWIFT has grown to be an indispensable part of the global movement of money.

SWIFT also came up casually after a meeting I recently had with SRI's new president, David Parekh. On the way to the cafeteria, I mentioned SRI's involvement in SWIFT, and not only was President Parekh interested, but he also mentioned it at the opening of his next day's All Hands Meeting! (I had met with him to tell him about the Alumni Association. All in all, I found him very engaging, and his background in contract research should bode well for the Institute.)

In the obituaries, you will read about three remarkable people typical of SRI staff: a dedicated leader in a field of science who espoused the value of publishing in it, a computer scientist turned serial entrepreneur, and a dedicated researcher who, reflecting today's news, found in the United States a sanctuary of safety and opportunity, something he gratefully acknowledged.

Finally, in this issue you will see how our friends in England rose from the pandemic's ashes to rekindle their friendships through a museum visit and lunch. From their smiling faces, you can tell how joyous their meeting was.

Now it's our turn here: The Spring Fling at Burgess Park on May 19. The last time this event was held in Burgess Park, we had one of the biggest turnouts ever. Let's show our British friends that we, too, can pry out of our COVID cocoon, stretch our wings, and enjoy this free lunch. It's easy to sign up, either through mail or email, so please don't set the invitation aside and forget!

Cybersecurity Baked into Silicon Becomes Reality: Implementation of CHERI



In a joint research project to revisit fundamental design choices in hardware and software so as to greatly improve system security, SRI and the University of Cambridge developed CHERI. Spelled out, CHERI is Capability Hardware Enhanced RISC (reduced instruction set computer) Instructions.

CHERI fundamentally changes how software accesses memory, and it is transforming cybersecurity. These changes are inherent to the hardware and the design of the silicon itself—protecting against even the most elegant attempt at a software workaround. In January, Arm announced the Morello Board, the first demonstrator board produced in its effort to implement CHERI in hardware. Hundreds of CHERI-powered Morello boards are being sent this year to companies, universities, and public research institutions for evaluation. Research agendas are now in place to test the new architecture.

Since 2010, CHERI has been supported by the DARPA (Defense Advanced Research Projects Agency) CRASH (Clean-Slate Design of Resilient, Adaptive, Secure Hosts), MRC (Mission-Oriented Resilient Clouds), and SSITH (System Security Integration Through Hardware and Firmware) programs, as well as other DARPA research and transition funding and UK Research and Innovation (UKRI), among others.

Sources:

For details about the development of CHERI, see SRI's article in The Dish: <https://medium.com/dish/the-new-cheri-enabled-morello-boards-entirely-new-hardware-making-it-harder-for-bad-actors-to-3375ff5b231>

Arm Unveils the Morello Board, with Its First High-Performance High-Security CHERI-Enabled Chip: <https://www.hackster.io/news/arm-unveils-the-morello-board-with-its-first-high-performance-high-security-cheri-enabled-chip-3e5e165b54f4>

Capability Hardware Enhanced RISC Instructions (CHERI): <https://www.cl.cam.ac.uk/research/security/ctsr/cheri/>

Arm Morello Program: <https://www.arm.com/architecture/cpu/morello>

SRI Spin-off Accuknox Dramatically Enhances Cloud-Based Cybersecurity



SRI spin-off Accuknox uses SRI's patented technology to protect applications, networks, and data in the cloud for large enterprises and open-source applications.

As more and more companies move their data and computing resources to the cloud, the need to continually verify trust in their systems and address threats quickly and effectively becomes more urgent. Accuknox dramatically enhances cybersecurity defenses through a high-performance runtime zero-trust container that protects applications, networks, and data.



“Zero-trust” is the idea that all network environments should be deemed hostile and that everything thus must be verified before access is granted. With businesses moving their IT infrastructure to the cloud and computing being distributed throughout various locations and servers, containers are being used to break operating systems into separate spaces to enable applications to run safely. By being isolated from other applications, containers allow developers to create environments with predictable behaviors.

The Accuknox security solution draws on SRI's patented machine learning-based anomaly detection, data provenance, and data tracking technology. For example, with unsupervised machine learning, the system is constantly learning what is good and what is bad to spot abnormal activities. Data provenance is a tracking record for data. Accuknox is also using variational autoencoders, deep-learning neural networks that can generate missing data at a high level of probability. Accuknox enables companies to isolate, track, and protect every aspect of data on their networks and applications at a fine-grain level.

Some of the world's top security companies and credit card companies are already using the Accuknox cloud-based platform.

Accuknox closed a seed round of funding in late 2020 and plans to continue to build products on open-source technologies and give back to communities. Ultimately, Accuknox hopes to make cloud security as intuitive, fast, and functional for users as performing a simple Google search.

Source:

SRI press release: <https://medium.com/dish/accuknox-dramatically-enhancing-cloud-based-cybersecurity-for-large-enterprises-and-open-source-370e7f38303c>

SRI's Smart Excavator: Drive It Like a Video Game or Hands Free

SRI has created a prototype robotic smart excavator that can be operated remotely or autonomously, as well as in the traditional way. Trained and skilled operators of complex heavy machinery such as excavators are in short supply and often work in dangerous settings. This smart machine can address both concerns.



Photo captured from SRI Robotics YouTube video <https://www.youtube.com/watch?v=ltzXGKKKyLk&t=9s>.

The smart excavator is equipped with several three-dimensional cameras with depth sensors pointing in all directions, as well as antennas and wireless communication equipment. The cameras enable the excavator to work on its own when needed, following preprogrammed instructions on where to dig, which it can follow all day and all night without interruption.

In addition, a skilled operator using a virtual-reality headset can view what the excavator sees anywhere in the world via the internet and conduct digs even if the construction site is thousands of miles away. The operator manipulates the machine with a pair of controllers—joysticks à la video games. The joysticks are not mandatory, however. The smart excavator's digging arm and bucket can replicate the movements of an operator's arm in real time using a motion-tracking controller. Thus, the operator can intuitively "dig" with his or her hand.

As a safety feature, the smart excavator has an intelligent people detection feature that causes it to freeze and flash warning lights when somebody or something breaches its safe operating area.

SRI's smart excavator has the potential to be used in hazardous environments. For example, it could be used to remotely dig a pipeline in the desert or clear snow from mountain roads while its human operator sits in a safe place.

Sources:

SRI YouTube video: <https://www.youtube.com/watch?v=ltzXGKKKyLk&t=9s>

Online articles:

"Smart" excavator. How to drive heavy machinery like in a video game. <https://gamingsym.in/smart-excavator-how-to-drive-heavy-machinery-like-in-a-video-game/>

Smart Excavator Can Be Operated Using Simple Video Game Motion Controls. <https://gizmodo.com/sri-smart-excavator-can-be-operated-with-motion-control-1848640584?fbclid=IwAR2A4KFDp4RIDL-gRVZj0eG8-1Lw-NtbPLICOx1KNCKesG2IujhFiTsMGXA>

Unmanned excavator with VR control tested in practice. <https://digitnews.in/unmanned-excavator-with-vr-control-tested-in-practice/>

Smart Construction Equipment May Help Build Future Shopping Centers. <https://www.lifewire.com/smart-construction-equipment-may-help-build-future-shopping-centers-5222278>

Reversing Opioid Overdose: SRI Bioscience Developing High-Concentration Naloxone Formulation

SRI Biosciences was awarded a 3-year, \$14.7 million contract sponsored by the Defense Threat Reduction Agency through the Medical, Chemical, Biological, Radiological, and Nuclear Defense Consortium (MCDC) to continue development of a high-concentration naloxone product for intravenous (IV), intramuscular (IM), and subcutaneous injection or IV infusion.

Naloxone is a medication approved by the U.S. Food and Drug Administration (FDA) that rapidly reverses opioid overdose. In October 2021, the FDA approved a high-dose (5-mg) naloxone formulation (trade name ZIMHI) administered via a single-dose, prefilled syringe through IM or SC injection. The FDA previously approved injectable naloxone hydrochloride products in 0.4-mg and 2-mg doses under the trade name Narcan.

Under a prior contract, SRI had developed a high-concentration naloxone formulation (10 mg) in a large vial designed to deliver multiple doses. The new contract will advance this formulation to U.S. market approval, with the ultimate objective of commercializing and licensing it as a countermeasure for individuals who have received toxic doses of ultra-high-potency synthetic opioids.

The Department of Defense identified the need for a high-dose naloxone in a multiuse vial in response to current concerns about ultra-high-potency synthetic opioids. According to the Centers for Disease Control and Prevention, synthetic opioids (primarily illicitly manufactured fentanyl) appear to be the primary cause of overdose deaths in the United States, which increased 38.4% between the 12 months leading up to June 2019 and the 12 months leading up to May 2020. The potential of a mass casualty public health event involving ultra-high-potency synthetic opioids is an increasing concern as well. These opioids pose a threat for both military and civilian populations, including first responders. While naloxone is known to be an effective antidote to opioid overdose, higher doses than those currently available are required to treat individuals who have received toxic doses of synthetic opioids.

Medics and other clinicians will be able to use SRI's naloxone injection to rapidly deliver 10-mg doses as needed

to resuscitate patients and treat opioid-induced respiratory depression. The multidose vial enables medical staff to deliver additional doses in the event of re-narcotization, which is common with synthetic opioid overdoses.

This effort is sponsored by the U.S. Government under Other Transaction number W15QKN-16-9-1002 between the MCDC, and the Government. The U.S. Government is authorized to reproduce and distribute reprints for Governmental purposes notwithstanding any copyright notation thereon.

Sources:

SRI press release, December 8, 2021: <https://www.sri.com/press/press-release/sri-bioscience-awarded-14-7-million-contract-to-continue-development-of-high-concentration-naloxone-formulation/>

FDA press release: <https://www.fda.gov/drugs/news-events-human-drugs/fda-approves-naloxone-injection-counteract-opioid-overdoses>

SRI to Continue Leadership Role in Regional Education Laboratory—Appalachia



The Institute of Education Sciences of the U.S. Department of Education awarded SRI Education a \$23 million, 5-year contract to lead the Regional Educational Laboratory (REL)—Appalachia through 2026. SRI has been leading REL Appalachia since 2017 and will continue to partner with regional educators and leaders to improve equitable access to learning opportunities and strengthen outcomes for all students.

One of 10 RELs around the country, REL Appalachia serves Kentucky, Tennessee, Virginia, and West Virginia by addressing high-leverage needs in education. These regional

partnerships combine rigorous research and training, coaching, and technical support with practitioner-focused dissemination to ensure that evidence informs practice in a timely manner to benefit students.

SRI leads REL Appalachia with experts from business partners at Education Development Center, Erikson Institute, Insight Policy Research, L-ovation, Magnolia Consulting, and Plus Alpha Research & Consulting.

Source:

SRI press release, January 14, 2022: <https://www.sri.com/press-release/sri-awarded-23-million-contract-for-education-research-partnerships-across-kentucky-tennessee-virginia-and-west-virginia/>

SRI's Mechanical Testing Machines to Be Used for Education Purposes

By Don Shockey

SRI is in the process of transferring its mechanical testing machines to the Materials Science and Engineering School of Case Western Reserve University (CWRU) in Cleveland, Ohio. The machines, which measure deformation and fracture behavior of metals, ceramics, polymers, composites, and geological materials under tensile, compressive, and shear stresses, can exert loads ranging from grams to thousands of kilograms. They have been used by SRI's Center for Fracture Physics to develop new materials and structures for body and tank armor, bio implants, rocket launch assemblies, spacecraft components, and many other industrial and military applications.

CWRU distinguished professor John Lewandowski visited SRI on March 7 to inspect and catalog the equipment, which has an original purchase value of over \$1 million. CWRU anticipates a huge educational impact for its many materials science and mechanical engineering students.

HISTORY CORNER

The International Banking Network SWIFT and SRI's Role in Its Founding

By Don Nielson

By the time you read this, the regrettable war in Ukraine will have come to some fate we cannot see at the moment here in late February. But as of yesterday, February 25, a broadly supported decision was made to remove Russia and its banks from the use of the international monetary transaction exchange called SWIFT, a Belgian cooperative society. Well, you ask, what's that got to do with SRI, if anything? As with so many important innovations of the 1960s and 1970s, SRI was there at SWIFT's founding and helped it get launched, including leadership beyond its first decade of operation.

Back in 2004 as part of the book I wrote about SRI, I reviewed SWIFT's first 30 years and the role SRI played. But before delving into that, I would like to add that its use as a deterrent or penalty in sanctions is yet to be proven. But its potential is high and, hopefully, it will be very powerful. As recently as 2018, SWIFT linked about

11,000 financial institutions in over 200 countries, with over 32 million messages each day. There are perhaps lesser alternatives for Russia. It has its own internal system, but it pales aside its need to connect to the rest of the world for its financial operations. The other worry is whether SWIFT can be hacked by the Russians to deny its operation to everyone else. Even though it is designed to be secure and SRI reviewed its security back in the mid 1980s, SWIFT has not been subject to an all-out cyber war.

In any case, here is the early story about SWIFT and SRI taken from *A Heritage of Innovation*: "The Birth of SWIFT—The Interbank Network."



SWIFT, an acronym for the Society for Worldwide Interbank Financial Telecommunication, is the organization whose facilities communicate virtually all financial transactions among international banks. Its role has become essential to international banking, and in 2000 it accommodated some

7,000 users in 192 countries, transmitting more than 1.2 billion messages involving value in excess of US\$5 trillion.¹ SWIFT was founded in 1973 by nearly 240 banks, mostly in Europe. SRI's role in SWIFT began as its founding members, struggling with both concepts and national differences, recognized the need for help in converging on both functional and organizational design. SRI's principal entrée into SWIFT came from its work for Midland Bank in England, but also linked to SRI relationships in Scandinavia and even reached back to its creation of automatic check processing for the Bank of America (BoFA) in the 1950s.^{2,3}

The idea for an international interbank financial transaction network began in England in the deliberations of a domestic bank cooperative called the Interbank Research Organisation, located in London. The spearhead for the concept that became SWIFT was Charles Reed of that group. SWIFT was to be a neutral, somewhat autonomous organization with oversight by representatives of its member banks. But when the organizational and functional design effort broadened to involve banks from the European Community, the group encountered difficulties not unlike the United Nations. It was then that the members recognized the need for a separate party to guide the deliberations and help resolve their differences. Thus, Reed asked Don Fiske of SRI whether it could take on roles such as offering advice, facilitating discussions, helping resolve differences, and ultimately gaining consensus among the participating member banks. Though the initiative was clearly European, the United States, in the party of the American Banking Association (ABA) and banks like City Bank, BoFA, and Chase Manhattan, also participated, one of which led to another SRI linkage.

On BoFA's side of the pioneering ERMA project was Al Zipf, whom the bank hired in the early 1950s to guide its movement into automatic check and data processing. Zipf ultimately became BoFA's most knowledgeable person in that area and its Chief Technical Officer. Later in his career, as one of BoFA's representatives to the technical committees of the ABA, he became aware of the growing volume of international checks and other financial instruments. It was the early 1970s and yet the conveyance system of the day, incredibly, consisted of couriers who filled the skies moving paper from one bank to another. So, while U.S. banks may have had some reluctance about European leadership in this area, to those like Zipf, it was eminently clear that a worldwide network was needed to handle the relentless increase in international financial transactions. In his ABA

role, Zipf sought to identify a consultant to facilitate the emergence of SWIFT.

Recalling the good work that SRI had done on ERMA and perhaps because of our independent status, Zipf called SRI's Dennis Finnigan to see if SRI might be interested in helping create such a capability. Finnigan promised to look into it and immediately got in touch with Fiske who, coincidentally as mentioned above, was already in discussions with the SWIFT leadership. SRI reacted quickly to this opportunity, winning a project to help create SWIFT.

When SRI arrived on the scene, the basic functional and organizational concepts were being explored, albeit by a somewhat dysfunctional working group. As mentioned, the organization sponsoring the initiative was the Interbank Research Organisation, in London, and its internal name for the project was simply the Message Switching Project (MSP), governed by a steering committee. Under this rubric, several design subcommittees were created. One was The Organisation and Legal Sub-Committee of which Fiske became a member. Under the auspices of the MSP and with participation of its members, SRI prepared the major founding documents for SWIFT, its organizational structure, and its by-laws.⁴ These documents, in the form of SRI reports, established the basis for operation, financial arrangements including SWIFT's nonprofit status, and the roles of the member banks. Because of legal considerations, the organization was located in Belgium, which gave rise to calling the organization a "Society," a nontaxed class of organization under Belgian law. Interestingly, and relevant to the power of acronyms, the early name for the new organization was the Society for International Financial Telecommunication.⁵ Within a month, and presumably for its nice connotation, the acronym became SWIFT. Finnigan indicated that SRI originated the name as part of its authoring role.⁶

A good example of SRI's involvement in the genesis of SWIFT was its helping to find a founding president for the organization. Fiske was visiting Menlo Park and was having dinner at Finnigan's home in the spring of 1973. When Fiske noted that SWIFT was looking for a person who could aggressively launch the company, Finnigan immediately thought of someone he had mentored and knew well who had been in charge of data processing at Scandinavian Airline System (SAS) and had come to the United States to avoid Sweden's onerous tax situation. His name was Carl Reuterskiold, and he was living at that time in New York but

was homesick for Europe. Finnigan called him that same evening and learned that Reuterskiold was interested, but lamented that he couldn't be available until October. As fate sometimes plays out, that's exactly when SWIFT was scheduled to get off the ground, so Fiske nominated him for the job and he got it. SRI also helped identify and recruit the chief financial officer, as well as individuals for several other key roles.

As the SWIFT system was beginning to take shape, member banks were still worried about how secure the system would be. SRI was asked to examine and review both this issue and other aspects of its technical design.

In October 1976, SRI conducted a study that was intended to be an operational audit; that is, until the initial system operation was delayed. That delay meant that SRI was forced to examine the security of the SWIFT system design rather than operation.⁷ The report made extensive recommendations on procedures, access, physical, and network security for both SWIFT and its member banks. Examples and summaries of the SRI recommendations follow:

- In the absence of written security procedures, SWIFT should develop a written security policy governing external banks or public disclosures to be issued by the Director General and maintained by an information control officer for the entire SWIFT organization. Specific actions were cited.
- Given the size of the financial stakes involved, SWIFT should examine its need for insurance to cover the loss of information.
- Member banks should take a number of actions (spelled out) to give physical protection to its terminals and logical protection to its SWIFT access positions to protect against unauthorized entrance into the SWIFT system.
- The link between the member bank and each country's (or region's) terminal concentrator should be encrypted, and all uses of the public switched network for such linkage should be logged.
- Extensive recommendations, ranging from security to operational effectiveness, were made for the operation of the regional concentrators and the switching centers.

After the SWIFT system went online, SRI continued to examine its operations. A study for an information management system was completed in 1983, the usefulness of expert systems for SWIFT was examined in 1985, the qualifications of cryptographic algorithms for the User Security Enhancement Project were reviewed in 1991, and other more sensitive security work followed.

Thus, SRI was a party to the establishment and ongoing success of SWIFT. Reuterskiold would lead the organization through its first 17 years, and for over 25 years SWIFT has operated successfully, expanding to become the cornerstone of international banking transactions that involve trillions of dollars each year.

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1. Taken from www.swift.com on February 22, 2001.
 2. This account of SWIFT draws on personal communications from Dennis Finnigan, January 19, 2001, and Don Fiske, February 9, 2001. In the period of the account, Finnigan was one of three vice presidents that headed SRI operations, and Fiske was head of the Management Systems Division for Europe.
 3. See Chapter 2 about ERMA, the world's first automatic check processing machine.
 4. *Organisation Recommendations for Proposed Society for Worldwide Interbank Financial Telecommunication (SWIFT)*, SRI Project 1570-2, March 20, 1972; and *Organisation Bylaws for SWIFT*, SRI Project 1570-2, July 14, 1972.
 5. As found in the title of an SRI project report dated February 14, 1972.
 6. Dennis Finnigan, personal communication, January 19, 2001.
 7. J.M. FitzGerald, K. Drexage, and G.W. Boyce, Society for *Worldwide Interbank Financial Telecommunication*, Interim Report II, February 1977, SRI Project 5885, entitled "An EDP Security Audit," from October 25, 1976 to February 16, 1977.

UK Alumni Visit to the Science Museum, London

By David Gibby

On Sunday, August 15, a group of UK alumni met to visit the Science Museum, in South Kensington, London. This popular venue, which attracts over 3 million visitors a year, was founded in 1857, initially financed by the surplus funds from the Great Exhibition, 1851. It was our first get-together since the COVID “lockdown,” and because of restrictions still in place in 2021 and to avoid overcrowding, we had to make reservations for a specific time slot.

The museum stages a number of special exhibitions in addition to the permanent displays, and we had obtained tickets to visit the “Brass Steel and Fire” exhibition. This included some remarkable miniature steam locomotives—working models that had been built by amateurs during the Industrial Revolution. Many of these had been built from scratch, on the kitchen tables of people as diverse as clergymen, lace-makers, and aspiring engineers.

We also admired the world’s oldest clock and watch collection, which includes more than 600 watches, 90 clocks, 30 marine chronometers, and a number of fine sundials and examples of hand engraving, mapping the history of innovation in watch- and clock-making in London from

1600 to the present day. Among the collection’s highlights is the fifth chronometer, made in 1770 by John Harrison, the inventor of the marine chronometer, and a four-month-duration long-case clock made by the father of English watch-making, Thomas Tompion.

One of the other free exhibitions, appropriately titled “Our Future Planet,” explores the technologies being developed to remove carbon dioxide from the atmosphere. These included methods of capturing carbon dioxide from the air and installing systems to prevent it leaving the power stations and factories that currently produce it. The exhibition was partly financed by a major oil company, and there were demonstrations outside the Science Museum by some people protesting against what they considered to be “greenwashing” of the company’s reputation.

After our visit, we walked to our lunch venue, the Apero Restaurant Bar, where the reasonably priced standard lunch menu included a glass of Aperol spritzer. Some of our group decided to pay more for the menu that included an unlimited supply of Aperol spritzer, which helped to ensure some lively discussions and jollity!

We look forward to our next get-together, when hopefully more of our group will feel that COVID has receded sufficiently for it to be safe to meet again.



Lunch at Apero Restaurant Bar. Left to right are David Gibby, Bob Morgen, Sonia and Andy Shaw, Peter Weissshuhn, Nick and Gillian Collin, and Anne Saunders.

Flying “Compassion Flight” Missions for Angel Flight™

By Clay Ross

If you were suffering from a severe medical condition, you would get treatment at a hospital. If that condition was extreme or rare and you needed to be treated by a specialist, in the San Francisco Bay Area you would go to hospitals such as Stanford, UCSF, or Children’s Hospital. Now imagine you live hundreds of miles away, perhaps in a rural community; your travel for treatment could take many hours by car, which could worsen your condition or at least cause great pain on top of the discomforts you endure daily due to your illness. Maybe you are fortunate enough to live close to an airport where you could catch a feeder flight to the Bay Area, but the flights are expensive and you have to travel every few weeks for your treatment, and you can’t afford the expense of travel. And even if you have access to these flights and can afford them, it is likely that your condition is accompanied by a compromised immune system; being locked in the plane with a hundred people could literally be a death sentence.

Angel Flight West (AFW) was created in 1983 to serve patients who are dealing with exactly these circumstances. The top of the AFW website states: “At no cost to passengers, our volunteer pilots transport people in need to the medical care they deserve.” The flight costs are donated by the pilots who fly the missions, in planes they own or rent. AFW serves the western 11 states, and it is one of seven such organizations in the United States that together serve all 50 states. Last year, AFW alone flew 4,144 missions, serving 983 patients.

I learned about Angel Flight in early 2020 from a fellow private pilot, and I knew immediately that I wanted to get certified to fly for this organization. By mid-March, I had completed the online training, which is focused on how the volunteer pilots need to act and what they need to do when they fly a “compassion flight.” Next, I submitted my flight experience and medical records along with my application. Within a few days, I was approved—just as the entire organization screeched to a halt as we all sheltered in place. The missions AFW flies are always important, often urgent, and often relate to life-threatening conditions. But the threat of spreading COVID and the liability that posed were too great a risk for the organization to take on, so the fleet stayed grounded for months.

On February 1, 2021, I received a letter from AFW stating that I was eligible to receive an early vaccination “as frontline healthcare personnel with patient contact as part of volunteering with AFW - conducting...Essential Services as specified in the CDC.” I immediately made the appointment and got my first shot the next week after presenting my letter as proof of early eligibility.

Two weeks after receiving my second shot, I flew my first Angel Flight mission, a 25-year-old patient suffering from a rare and painful condition that threatened her left kidney. I picked her up in Novato and met a second AFW pilot in Elko, Nevada, who carried her the rest of the way to Salt Lake City for a pre-op appointment with one of only two surgeons in the country who are familiar with this condition. During the two-hour flight, I learned about the patient’s ailment and all the side effects it was causing on her body. Hearing about the pain someone is going through is often difficult; hearing it from a woman who was just two years older than my daughter made the story even more poignant. One month later, the same patient was ready for surgery, and I was fortunate to be able to fly her to Elko again.

During 2021, I flew a total of 13 missions, each of them unique, each of them rewarding, and all of them with extremely grateful passengers suffering from conditions and pains that would test the toughest of us. I want to share just a few of those stories.

After the two flights to Elko, I flew an 11-year-old boy from Bakersfield to Palo Alto for a follow-up appointment for the heart transplant he had when he was nine. When I asked his mom if they’d flown with Angel Flight before, she said they fly with Angel Flight every two weeks, which amounted to roughly 50 flights so far. But this boy was nowhere close to the youngest patient that AFW flies; I remember seeing one mission for a patient who was 10 months old and was “going home after 9 months in the hospital.” Some stories are more heart-wrenching than others.



I have some regulars who request me when they fly. One is a couple who fly every several months between Santa Ynez and Portland. I will be flying them for the third time in early April. I enjoy the repeat missions because it gives me a better chance to know the passengers and learn their stories—the things they enjoy in life, how they overcome their pain and disabilities.



One of the common remote destinations is Arcata because it serves all of northwestern California. Last November, I booked a mission from Palo Alto to Arcata, immediately followed by a mission from Arcata to Novato. The first passenger, whom I'll call Debbie for privacy reasons, was being treated for "abdominal adhesions," a condition that causes your abdominal organs to become constricted as the adhesions grow. There is no cure, and the adhesions cannot be removed because they grow back twice as fast. Radiation and chemotherapy also accelerate the growth of these adhesions. And if Debbie were to exert too much or put much pressure on her abdomen, the adhesions would also grow. She is 39 and looks fit, but she gets around in a wheelchair most of the time just to avoid "angering the adhesions." About 45 minutes into the flight, I naively asked if she was ever in much pain, and she said she was always in a lot of pain, even right then. Over the seven years she had suffered from this condition, she had become a master at hiding the appearance of her pain. I asked how she could mask her pain so well and have such an upbeat attitude and passion for life; she responded, "I choose happy."

When Debbie learned that I was flying another patient from Arcata to the Bay Area, she asked who it was. I was not sure I could share the name of the other passenger, so I described

her. Debbie immediately identified the second passenger, "Beth," and said they had been close friends for years but lost contact when Beth got breast cancer five years earlier. It turns out that Beth had been Debbie's nutritionist when she developed the abdominal adhesions. As soon as we landed, Debbie sent a text message from my phone to say hello to Beth before she headed home with her young family.



The flight to Novato with Beth was just as inspirational. Beth was an avid outdoor enthusiast: kayaking, mountain biking, backpacking, climbing, everything. She had been treated for breast cancer five years earlier and was in remission. But just six months short of the five-year "all-clear" point, the cancer was back and it was Stage 4. She was traveling to Marin for treatments she could not get in Arcata. As she watched the scenery slipping by below us, Beth said the most rewarding thing I have heard on any of my missions: She said that she looks forward to these flights because she gets to look down on the beautiful scenery that she explores on bike, foot, and kayak and that it almost offsets the fact that the purpose of the flight is to treat her terminal cancer.

When I flew Debbie again last month, the first thing she told me was that Beth had passed away in January. When I asked if she had a chance to reconnect with Beth, she said, "Yes, that message I sent her from your cell phone."

In December, I volunteered for a "Santa Flight," which involved delivering gifts that we had purchased for one of the younger frequent fliers. Rachel and I loaded up the plane with gifts, donned our Santa caps, and were met at Fresno airport by two very excited young girls and their mom. Obviously, this was a very different mission than taking someone to their medical appointment, but Angel Flight sees its mission as going beyond providing access to medical treatment to enriching the lives of its passengers. Angel Flight

also carries disabled children and burn victims from all over the state to camps that are held in the mountains each year.



When someone learns I am a pilot, the inevitable first question is, “Where do you fly?” But to me, the more meaningful question is now, “Whom do you fly?” I love to

fly the Angel Flight passengers because they give me the gift of perspective and a special sense of purpose. I feel fortunate to meet every one of my patient-passengers and feel more fortunate for having known them.

Angel Flight exists because of volunteers. They need drivers and Mission Assistants just as much as pilots. The drivers, called “Earth Angels,” volunteer their time and mileage to provide free ground transportation at either end of the flight, if needed. The Mission Assistants accompany the pilots on flights when the patient might need in-flight attention.

It is possible that you already know at least one Angel Flight volunteer. My daughter and I were talking to one of her best friends when we learned that her dad is not only a pilot, but is also the Northern California wing commander for AFW. If you would like to become an Angel Flight volunteer as an Earth Angel, a Mission Assistant, or a Command Pilot, please go to angelflightwest.org. Or feel free to contact me if you have any questions (clay.ross@yahoo.com).

CREDIT UNION NEWS

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 SRI Federal Credit Union

Plan to Attend the Spring Fling at Burgess Park in Menlo Park on Thursday, May 19, from 11:30 a.m. to 2:00 p.m.

Join your fellow alumni on Thursday, May 19, for a free picnic in Burgess Park.

This is a free event for all alumni members and their guests. Please send in your completed reservation form, including the number of box lunches you'll require, to the SRI Alumni Association by May 16. If you'd prefer, you can email the required information to steering-committee-alumni@sri.com. For questions, please contact Dave Harvey at dave.harvey620@gmail.com. We hope to see you there!



HALL OF FAME

Who Do You Believe Made an Exceptional Contribution to the Success of SRI? Nominate That Person for the SRI Alumni Hall of Fame!

The SRI Alumni Hall of Fame honors former staff members who made exceptional contributions to the success of SRI.

All former staff members are eligible, but nominees should meet the following criteria:

- Significant, lasting contributions to the success of SRI
- Contributions recognized by staff, management, or clients
- Contributions in any area of research, management, or service, such as
 - Establishing a new laboratory or a new field of research
 - Performing an outstanding recognized service
 - Clearly demonstrating qualities of leadership, vision, and creativity
- What did the person leave behind?
 - Enhanced reputation for SRI
 - New or enhanced research, business, or support activity or facility.

Please prepare a write-up of about 300 words indicating how your nominee meets these criteria. If you have questions about the nomination process, members of the Steering Committee will be happy to answer them. Send the write-up or questions to steering-committee-alumni@sri.com or SRI Alumni Association, 333 Ravenswood Avenue, AC-108, Menlo Park, CA 94025-3493.



The SRI Alumni Association welcomes new members:

**Donna Davidson
Elizabeth Macris
William Park
Edward (Ed) Riccio
Tyler Richmond
Lorena Rolland
John Tanzi**

And welcomes back previous members:

**John Bramer
Curt Carlson
John Yarborough**

We look forward to your participation in the Alumni Association and hope to see you at our next group event.

SRI International Alumni Association Cash Flow/Income and Expense

Year ending December 31, 2021

CASH BALANCE as of 01/01/21		\$37,775.31
INCOME		
Cash income from membership dues and fees	\$6,535.00	
Dividend income from SRI Federal Credit Union account funds	\$12.09	
TOTAL INCOME	<u>\$6,547.09</u>	\$6,547.09
EXPENSE		
Hall of Fame plaque and plates	\$54.11	
Office supplies	\$193.47	
Publications (postage, printing, etc.)	\$1,979.45	
Reunion	\$93.69	
Spring Fling @ Filoli	\$3,582.32	
TOTAL EXPENSE	<u>\$5,903.04</u>	\$5,903.04
CASH BALANCE as of 12/31/21		\$ 38,419.36

Directory Addendum

The enclosed directory addendum (covering the period December 1, 2021 to March 31, 2022) contains new members and corrections. Please add it to your 2022 Directory.

Ivor Brodie*

Ivor Brodie died on February 6, 2022, at age 93 in Palo Alto, California.

Ivor was born in London in 1928 to Eastern European immigrants. His father, Alf, was a cabinetmaker, and his mother, Jenny, was a saleslady. Ivor's early life was influenced by both world wars. His father died young from the stress of trench warfare in World War I, and, as a result of the bombing of London during World War II, like other children Ivor was sent to the English countryside. There, he attended the Alleyn (all boys) Grammar School, founded in the 1600s.

Near the end of World War II, Ivor was drafted into the Royal Air Force but saw no hostilities. After discharge, he enrolled at the University of London and studied electron beams and their uses, earning two bachelor's degrees, one in mathematics and physics in 1950 and one in special physics in 1951. Ivor was awarded a master's degree in physics in 1956.

During pursuit of a PhD in physics, which Ivor obtained in 1959, he worked in the nearby General Electric Research Laboratory, also known as Hirst Research Centre. Soon after Ivor married Audrey, who became his lifelong partner, they sailed aboard the *Queen Elizabeth I* to the United States where Ivor worked at Westinghouse in New York City. In 1962, he joined Varian Associates in Palo Alto, California, as a research physicist, eventually becoming director of research for the tube division. In 1969, Ivor and several colleagues left Varian to start a company called Photophysics and there made the first video terminal with a built-in printer. However, the company did not survive the deep recession of the 1970s.

Ivor joined SRI in 1973 as manager of the Physical Electronics Program in Fred Kamphoefner's lab. Ivor's group thrived and grew to become a department in October 1981 and the Physical Electronics Laboratory in 1986. Ivor directed the lab until he stepped down in 1995 to become senior scientific advisor (emeritus), a role he retained until retiring from SRI in 2004.

After his time at Photophysics and during his early years at SRI, Ivor completed a DSc (doctorate of science) from the University of London, a level in England higher than a PhD.

Under Ivor's direction for two decades, the Physical Electronics lab became a world leader in solid state physics and the fabrication of vacuum microelectronics and nanoelectronics. Developments included photoconductive drums and toners for copiers, field emission arrays for vacuum electronics and flat-panel displays, recorders for medical radiography, and the tools for electron-beam lithography that enabled the printing of submicron features on the substrates of silicon wafers. With lab colleague Julius Muray, Ivor wrote a popular text on the subject (*The Physics of Microfabrication*, 1982). Ivor also brought to SRI its first electron microscope. The prominence of his lab's role in the creation of vacuum nanoelectronics led to his staff's founding the International Vacuum Nanoelectronics Conference, which is still being held.

Because of his technical skill and genuine concern for the staff and for promoting their careers, Ivor's teams were extremely devoted to him. Ivor nurtured and encouraged junior scientists. For example, under Ivor's guidance, Capp Spindt became perhaps the world's leading authority on small microscopic tips that, under vacuum, enabled bright displays. To give Capp recognition for his work, Ivor sponsored his being awarded a PhD based totally on his published work. (Ivor was adamant about publishing, his mantra being, "If it isn't written down, it didn't happen!") Chris Holland also credited Ivor for his advanced degree at Stanford University. Four of Ivor's staff members also became SRI Fellows.

While at SRI, Ivor was awarded 10 patents and an SRI Fellowship. He was a fellow of the American Physical Society and, from 1993 to 2004, was an adjunct professor in the Department of Electrical and Computer Engineering at the University of California, Davis. In 2015, Ivor was inducted into the SRI Alumni Association Hall of Fame for his leadership and technical brilliance in his field of submicroelectronics.

Beyond his technical excellence, "Papa Ivor" was very devoted to his extended family, played the flute, and was a man of faith, he and Audrey having been founding members of the Kol Emeth synagogue in Palo Alto. Until the end of his life, Ivor retained his positive attitude and sense of humor. He will be sorely missed.

Ivor is survived by his wife, Audrey; son, Alan; daughter, Sheila Levin; and sister, Phyllis Herman.

Based on information provided by Ivor's son, Alan Brodie; and on information in SRI archives.

Mark Steven Moriconi



Mark Moriconi died at age 73 on January 25, 2022, in Redwood City, California, after a decade-long battle with early-onset Alzheimer's disease. His home was in Atherton, California.

Mark was born to Bill and Ardevina Moriconi. After graduating from Kapaun High School in Wichita, Kansas,

he majored in English and mathematics at Wichita State University. Mark was awarded a PhD in computer sciences from The University of Texas at Austin and later completed the High-Tech Executive Program at the Stanford University Graduate School of Business.

Over his career, Mark published more than 20 technical papers and held many patents. He was an invited speaker, panelist, technical reviewer, program chair, and general chair at dozens of international conferences and workshops sponsored by the ACM/IEEE (Association for Computing Machinery/Institute of Electrical and Electronics Engineers), winning several awards for his contributions.

Mark joined SRI in August 1978 as a computer scientist in the Computer Science Laboratory (CSL). He assumed a management role as a program director there in 1986. In 1988, his program was titled Programming Environments; in 1990, he was promoted to director of the CSL, maintaining that position until he left SRI in 1997.

While at SRI, Mark was deeply involved in the government Defense Advanced Research Projects Agency community. He collaborated with his team and successfully wrote proposals with a groundbreaking vision that contributed to making CSL perhaps the most consistent and efficient revenue-generating lab at SRI. He was a member of ACM SigSoft (Special Interest Group on Software Engineering) forum, attending and organizing many conferences. As his colleague Olga Karobkoff recalls, at the conference he organized in San Francisco in 1996, he was respected by computer scientists from around the world. As a result of Mark's appreciation of style, planning, and preparation, the conference was a great success.

On leaving SRI in 1997, Mark successfully raised \$22 million in a Series A funding and formed the company SecureSoft, later to be renamed CrossLogix. Under Mark's leadership,

in a period of five years the company grew from 5 to 62 employees, opened offices in New York and London, and obtained contracts with Goldman Sachs, Deutsche Bank, Lehman Brothers, and Paine Webber. In 2003, the company was acquired by BEA Systems. After the sale, the technology CrossLogix was based on became a core component of the Oracle Entitlements Server.

Being independent and forward thinking, Mark left BEA to form the company Selytix. He continued filing patents and consulting. In addition, Mark was instrumental in providing guidance and support to colleagues in their early-stage venture companies. Mark was admired by those who knew him and, as Olga notes, "was intelligent, driven, and expected perfection."

Outside work, Mark engaged in his passions for gardening, sports, and wine. He enjoyed fine dining, cooking, and travel and loved sharing those experiences with the people he held dear. He also enjoyed walking to Peet's Coffee every day with his black Labrador, Tori, and even started to look like her later in life when they were both grey around the muzzle and wore all black.

Mark is survived by his wife of 33 years, Susan; son, Alex; brothers, Bill and John; and stepson, Jeff Bergman, along with grandsons, nieces, and nephews. Mark's stepdaughter, Lisa Bergman, preceded him in death.

Based on information from a colleague who worked with Mark at SRI and CrossLogix, Olga Karobkoff; and on an obituary published in The Almanac Online.

Juris Petricēks*



Juris Petricēks died peacefully in his sleep on January 26, 2022, at his home in Sigulda, Latvia. He was 85 years old.

Juris was born on May 5, 1936, in Pededze Parish, what is now the Alūksne region of Latvia. Juris's family's land was seized in 1940 during World War II when the first Soviet invasion resulted in the annexation of the Baltic countries of Estonia, Latvia, and Lithuania. Juris's father was lucky to avoid deportation to Siberia, and the family was able to remain on their land. From 1941 to 1944, Latvia was under the National Socialist

German occupation. Then, in 1944, during a second Soviet occupation, the reality of a Siberian deportation once again faced the family. They fled their beloved home in Latvia in advance of the Soviet Army. It was a difficult journey with many stops, leading to several years in deportation camps in southern Germany. In 1950, Juris's family immigrated to the United States, finding refuge through the generous sponsorship of several West Virginia families. Juris and other family members finally settled in Palo Alto, California, in 1952.

Juris graduated from Palo Alto High School in 1953. He then attended Stanford University, earning a BS degree in 1957 and an MS degree in 1959, both in electrical engineering. Between earning his two degrees, he enjoyed summer employment at MIT Lincoln Laboratory in Massachusetts. Juris began his career at SRI in January 1964, working in the Radio Physics Lab (RPL), later the Geoscience and Engineering Center. The focus of his work at SRI was atmospheric physics and radar technology. Under RPL, he spent spring 1971 to fall 1972 working at the Chatanika incoherent scatter radar 30 miles north of Fairbanks, Alaska. The latter half of his time at SRI was as a Senior Research Engineer for the NEXRAD (Next Generation Weather Radar) program, including a brief period when he assumed the responsibility of Project Manager. Juris retired from SRI in May 1997.

On August 26, 1961, in Brooklyn, New York, Juris had married Rita Rozenberga, who had also been born in Latvia. They moved to Palo Alto in December 1963. Together, they lived in the Alaskan bush while Juris worked at the Chatanika radar facility. Later in 1972, they moved to Menlo Park, California. After Juris's retirement, they made their home in Shelton, Washington, close to the West Coast Latvian Education Center. Juris had been born in a log home in Latvia, and the location in Shelton gave him the opportunity to realize his dream of building and living in a log home once again. Juris and Rita decided to return to Latvia permanently in 2008, moving to a comfortable apartment in Sigulda.

With the dissolution of the Soviet Union and Latvia becoming an independent country in 1991, Juris was able to re-acquire several hundred acres of the land that had been expropriated from his family in the 1940s. In 2000, Juris and Rita built a four-bedroom log home on one parcel of this land, but they were too elderly to farm the land in a fitting tribute to Juris's family's memory. With no children of their own, they were fortunate to find a young couple who were interested in starting a fish hatchery, Silenieki,

which has become a very successful operation over the years with considerable assistance from Juris. Juris and Rita became quite fond of the couple and their three children and spent several days each month in their separate quarters in the log home enjoying time together with their newfound surrogate family.

Juris was a major supporter of the Museum of the Occupation of Latvia and served on its board. He was also a long-term donor to the Vitolu Foundation, which helps support and finance young dedicated and talented students from low-income families to study at the Latvian universities. He was a supporter of the Student Corporation Talavija in Latvia and California. In 2007, Juris and Rita received the Latvian Pride of the Year Award in the Patronage category for their support in educating young people in Pededze Parish.

After Rita wrote a biography of her father, *Bertrams Rozenbergs*, Juris had it published in 2012. He then published his own book about his family, *Petricēks in Pededze Parish*, in 2015.

In 2000, Juris wrote to the editor of the New York Times: "Were I to die today, I would be glad that a portion of my estate would go to the United States, a country that has no equal." He was preceded in death by Rita, in 2010. The last of his siblings, Irene, passed away on February 3, just over a week after his death. Juris is survived by nieces, nephews, and extended family in Latvia, the United States, and Canada.

A farewell to Juris took place on February 4 among close relatives and friends in Kūdupe Cemetery, Pededze Parish, Latvia, where Rita is also buried.

Based on information provided by Linda Hawke-Gerrans and Patti Burns.

*Member of the SRI Alumni Association



Please consider joining the SRI Alumni Association. The association was founded in 1996 to provide former staff members the opportunity to keep in touch with SRI and their colleagues, to support the institute in a variety of ways, and to help perpetuate SRI's traditions and values.

SRI Alumni Association members enjoy many activities and services:

- **Alumni Association Newsletter**—Published three times a year, giving news about SRI programs, Alumni Association activities, and individual members (see past issues at <https://alumni.sri.com/newsletter.html>).
- **Membership Directory**—A regularly updated resource of contact information for association members.
- **Annual Reunion Meeting**—An opportunity for:
 - Socializing with other Alumni Association members.
 - Viewing the Alumni Hall of Fame Induction ceremony.
 - Hearing a prominent SRI speaker describe an important SRI project or organizational development.
- **Spring Fling**—A picnic or visit to a Bay Area point of interest; past trips have been to the Computer History Museum, the Hiller Aviation Museum, NASA-Ames, and the California Academy of Sciences.
- **SRI Archives**—Association members maintain and catalog SRI's photographic and nonproject archives.

We encourage you to participate in the SRI Alumni Association. Your first year's membership is free. Your membership thereafter will be \$25 per year. By completing and returning the application below, you will be enrolled and will receive future issues of the newsletter and invitations to all alumni events. Please indicate how you would like your information to appear in the Membership Directory. If you prefer that some or all of your contact information not be published in the directory, please indicate your preference below. Also, please indicate whether you would prefer receiving the newsletter as an electronic copy (PDF, which saves the association printing/ mailing costs) or as a hard copy. If you prefer to complete an application online, please do so at <https://alumni.sri.com/join.html>.

SRI ALUMNI ASSOCIATION NEW MEMBERSHIP ENROLLMENT (Please don't use for renewing your membership)
First Year's Membership Free!

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Publish contact information in the Membership Directory: Yes No

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Mail to: SRI Alumni Association, 333 Ravenswood Avenue, M/S AC-108, Menlo Park, CA 94025

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