<u>Letter to Morgan Ames, Josiah Hester, and Intel</u>

This letter is being written as a strongly critical examination of your three aloof products (by co-incidence, of course) in the past 12 years. For Intel it is the 2011 Claremont "demo." For Morgan Ames, it is her extremely critical book, "*The Charisma Machine*", and for Josiah Hester, it is his Protean SuperSensor project, all of which fail to address a simple milestone in Moore's Law.

Here is a joke. How many engineers does it take to change a lightbulb? None. Engineers don't want to change the lightbulb themselves. They want to get grant money to perpetually talk about it.

https://www.nationalgeographic.com/science/article/160225-solar-calculator-history-energy-objects "

In 1978, the first solar calculator was developed. 10 years prior, HP manufactured a scientific calculator of similar computation as the Teal Photon. Moore's Law took 10 years to miniaturize a desktop sized calculator into a pocket calculator. In 1995, Intel manufactured a Pentium processor. 16 years, later, Intel was able to solar power that processor. Unlike the calculator, it was never sold as a product.

Since that time, Ames and Hester have appeared in major news articles documenting trendy ideas or concepts.

From: https://henryjenkins.org/blog/2019/10/3/interview-with-morgan-j-ames-on-the-charisma-machine-the-life-death-and-legacy-of-one-laptop-per-child-part-i-w7jh5 :

"Negroponte exhibited some very wishful thinking in justifying the costs of the program. He'd tell governments that they should think of this as equivalent to a textbook, and put their textbook budget into this program. Amortized over five years, he said, a hundred-dollar laptop would be equivalent to the twenty dollars per year per student that Brazil, China, and other places budgeted for textbooks. But I found only one school in Paraguay that consistently used textbooks, and it was because they were sponsored by an evangelical church in Texas. If schools had any, they had some very old textbooks that were kept in the front office for teachers' reference only. Most teachers wrote lessons on a blackboard, and students copied them into notebooks that they were responsible for buying.

"Papert had a version of this analogy as well -- but instead of textbooks, he equated computers with pencils. You wouldn't give a classroom one pencil to share, he would say derisively -- but even if OLPC's XO laptop had actually been $100 rather than close to $200, that's a far cry from a ten-cent pencil. "Moreover, even ten-cent pencils were items that not all Paraguayan students could consistently afford."

Well, that $5 Raspberry Pi Zero got awfully close to $0.10! And that interview was in 2019, 4 years after the Raspberry Pi Zero debuted. But more on the Raspberry Pi some other time- I have criticisms for them too. And look at all the IoT devices that are being manufactured, that which Jensen Huang said would number over 1 trillion in the years ahead:
https://cacm.acm.org/magazines/2021/7/253454-a-battery-free-internet-of-things/abstract

So wait, I am noticing two trends. First, industry, academia, and its AI advocates are prioritizing IoT and energy intensive AI, but...but....they don't have enough cash to produce 9 billion $0.10 or $1 solar powered Raspberry Pis???? For every child and person on earth? 9 billion is less than 1% of 1 trillion. There are currently 8.045 billion people on earth. Sure, IoT devices are smaller, but 99% smaller, on average?

And Dr. Hester, brilliant and erudite scholar, who uses extensive bibliography in his 15 page 11/2022 Protean paper (2 full pages of 8 size font), establishes a fundamental design feature of his platform as "intermittent computing." Whether this is merely an academic exploration on the merits of intermittent computing for efficiently saving, storing, and retrieving data in static memory such as FRAM, or whether it is an attempt to completely replace legacy systems-both hardware and software, that relies on non-intermittent computing is not clear. However, with at least two papers on the subject: the first, his 2020 paper on project ENGAGE (the solar powered Gameboy), and his newest, slickest project using savvy terminology such as ML and inference peripheral for vision devices, one starts to question whether this research is prioritizing customers that already have many of the luxuries of basic computing.

So much focus is on state of the art systems, it is like Dr. Hester is trying to replace manual transmissions in automobiles with an automatic transmission at a much higher bill of materials. With the excellent advances in Koomey's law in the past 3 years by companies such as Ambiq Micro, it is highly questionable that there is not a legacy OS development being promoted for POSIX and interoperable hardware without all the bells and whistles (e.g. post-late 90s camera phones and beyond). So while Dr. Hester most likely needed to persuade the National Science Foundation with buzzwords that could produce drones with energy efficient ML Vision and Auditory processing, the numerous grants being given to his lab for auxilliary tools is implicitly placing basic communications for ordinary subsistence farmers in Paraguay second, who probably need a cell phone before they need a drone that can take pictures of their Amazon order for delivery confirmation.

The fact that Ames worked with Intel in the past, and despite her aversion to companies having influence in advertising on educational products such as the OLPC (Jenkins interview, 2019):

"Moreover, I would bring a critical media studies lens to this as well, and ask just what kind of influence advertisers including Nestle, Nickelodeon, and more should have in children's educations. These companies developed content specifically for the XO laptop that was widely popular during my fieldwork, and thus had preferential access to children via an avenue that most considered "educational." While I love the connected learning approach of really centering children's cultures in the learning process, I am very critical of companies' efforts to make money off of that."

The fact remains that Intel had solar Pentiums in 2011 which required far more processing power than RISC chips by ARM just as the OLPC products ended manufacture in 2012, and few would be able to predict the proliferation of smartphone and IoT devices that by one phone carrier, encourages a phone replacement every year: https://www.phonearena.com/news/T-Mobile-is-replacing-one-of-its-best-upgrade-offers-with-an-even-better-deal_id153324

""This program lets customers upgrade to a new phone every year and only requires them to buy a new handset on an installment plan, stay on that plan for at least six months, and pay half of the device cost." and inevitably end up in places like India where children hunt for them in literally toxic dumps: https://www.youtube.com/watch?v=QuBy6YzLMn0&t=3s

So, is Ames turning a blind eye to the largely abundant production of non-reusable phones that get unsupported operating systems after several years, while harshly criticizing the programs that actually was unique in consuming less than 2 watts of power for both the transflective display and processor?

Considering the Raspberry Pi 5 released in October 2023 uses more than 10x the peak power as the original 2012 Model A, Ames's criticism of the rare academic computing is far harsher than business as usual at Apple, Intel, Qualcomm, and Samsung.

Futhermore, Dr. Hester focuses on many state of the art components, such as MRAM:

"Existing timekeepers (i.e. real-time clocks) require significant amounts of energy to turn on and operate, are relatively large (millimeter scale), are slow to restart, and use energy proportional to the length of a power failure (which can be impractically long). This project takes advantage of the unique properties of emerging nano-scale non-volatile magnetic random-access memory (MRAM) devices, particularly adjustable data retention length, to create orders of magnitude lower power, adjustable, ultra-small timekeeping devices." from https://kamoamoa.com/projects/beyond-cmos/

While a solar powered computer most likely requires at least a modern processor such as a sub-threshold or near-threshold voltage CPU, requiring the chip to rely on all new exotic components and power management systems such as expensive FRAM and would only appear practical if there was a clear breakthrough in cost to manufacture of low-powered memory and clocks. A much more low-tech method would be to retain any legacy components, such as millimeter scale RTC while conserving as much power as possible with potentially buffering the intermittent tendency of energy scarce harvesters with lithium ion capacitors.

I was somewhat piqued by a recent Forbes article by Hessie Jones, who, analyzing men's traditionally dominant role in the tech sector, used the word "holistic" as a counterview to the systems approach of men: https://www.forbes.com/sites/hessiejones/2023/12/23/a-call-for-a-systemic-dismantling-these-women-refuse-to-be-hidden-figures-in-the-development-of-ai

"Bennet and Hailey agree that women attack a problem very differently from their male counterparts. "Women are holistic. They are intuitive, ...that's why we're in those positions to try to dismantle the system knowing that we still have to keep the infrastructure going, otherwise things will collapse."

Ames' criticism was implicitly or not, regarding men's tendency to design systems such as the OLPC according to an idealistic vision that suits developer's own childhood notion of technology. Perhaps too Montessori for Ames, Papert's constructionist concepts in Logo programming and self-guided learning was too open-ended for instruction in non-Western countries. That said, systems like the OLPC and their progenitors such as Hester's Protean modular carrier board can be perceived, at least by me, to be an attempt to correct some of the deficiencies of the OLPC's power consumption, but not its simplicity

and its interoperability with various vendors in the EDA and display market. As previously mentioned in my grant application, I suggested the chiplets and the hardware be modular to support a wider third party hardware market. By allowing a single laboratory to define the carrier board according to power management systems, the standard itself is limited to rigid save states that requires aforementioned costly FRAM. By allowing some flexibility in the components, the platform itself could be much more POSIX-like in the hardware analogue of the term. *That is* holistic.

By a similar comparison, Jones' critique could be extended to the Protean system, if only because it is a walled garden of hardware, and not as universal as it could be. For example, ARPANET is by today's standards, a closed system, but connected several universities. Protean is a collaboration of a number of universities, but does not appear to be any serious attempt to establish a portable standard that could be used internationally, as would an IEEE or ISO standard. The days of TCP/IP vs OSI are gladly over, and while standards like UCI-e have lots of industry buy-in, may be excessive in their use of IP/raw materials for minimally-high tech needs that address basic communications using next-gen low-power semiconductor fab design.

It's a shame that most of the researchers have been unavailable to comment due to NDAs or other professional duties. Having read much tech journalism over the course of 20 years from sites like Ars Technica, Tech Crunch, Tech Dirt, Gizmodo, WCCFTech, Fudzilla, Semiaccurate, Tom's Hardware, BoingBoing, Slashdot, Hacker News, Hackaday.com, and countless other mainstream sources such as Forbes, NYT, LA Times, Bloomberg, and Wired, I have noticed that for technology, some positions are just jobs, and for others, it is a passion. Perhaps being a critic like Roger Ebert is my only forté in the technology field, after having a curiousity more in the history of Silicon Valley and technological progress than any particular fad. They say you can't teach an old dog new tricks, and perhaps it is because of Intel's saavy demo and the excuse that yields would be a problem in 2012 in producing near threshold voltage chips. Well, it's 2023, and Ambiq Micro is up and coming. So Dr. Ames, I dare to repeat what those OLPC developers said, "well, those past machines maybe only appealed to some kids, but this one will have much more universal appeal!"

And to Dr. Hester, that walled garden Protean only appealed to some MIT kids, but a truly POSIX one will have much more universal appeal! "And Papert wrote about the universal potential of computers too -- he called them the "Proteus of machines," with something to appeal to everyone." I am curious if the Protean codename for Dr. Hester's https://protean.systems/ is a tongue-in-cheek reference to Papert's "Proteus". Dr. Ames, surely you caught that?

And to Linus Torvalds (who is not cc'd here, not knowing his email), Linux has become bloated, in a 30+year bromance with Intel, and Protean needs a new kernel for everyone, so that Dr. Hester does not become Linux without a GPL, unless Dr. Hester wants to become the Linus Torvalds of Hardware- a benevolent dictator without the blessing of the Saint IGNUcius, or Pope Pius VII, by crowning himself.

Lastly, the focus on intermittent computing is the Protean platform's most obfuscating design feature. It is like a return to the Tridentine Latin Mass. An open source platform could be translated much more plainly and on so many levels. It should be easy enough that anyone could put it together. Last year's TechRadar article on the "quest for the solar powered game console" was so narrow it was like denying the Motorola 68000 was used in anything other than a Sega Genesis. So respectfully, as someone who thinks you're sitting on a Latin text, will attempt to translate your obfuscatory Latin/Greek to the masses. You're most likely a descendant from Hawaiian nobility, masquerading yourself as "just" one

who had ancestors who were stewards of the land, begrudging your downgrade from a sovereign nation to one of fifty states. My father's grandparents, according to a story he told me last year after I asked, were landless peasants in Magisano, Calabria who walked two miles to grow and pick crops every day. My father is a retired welder. He slept with his 5 brothers to a bed and did not even attend high school. 8ᵗʰ grade was his last completed grade. I suspect you took one look at me and thought, this privileged white person. Block. And Southern Italian immigrants were discriminated according to their port of origin manifest upon arrival at Ellis Island: source: https://www.youtube.com/watch?v=naQiJtBZF1Q "How Italians became White" (and why I am still apprehensive of visiting most Southern states in the U.S). But I am not going to go in public and share this story about why I think am more deserving. I didn't use a story about Hawaii like you in your media story. Although if I tried, I would most likely bring some people to tears, like George Costanza competing for an apartment with an *Andrea Doria* shipwreck survivor: https://youtu.be/K_yeuO96dAA?t=238 My mom grew up in the mountains of Castel di Sangro. I can see why you moved to Georgia though- I inherited my mom's genes for cold weather.

After my great grandparents were done picking to trade/pay their taxes, could pick what they could for themselves as my dad said, "to survive." I understand your interest in becoming a chief system architect, and a Surgeon General (like your great grandfather, the Postmaster General), who wants to slap a carbon nutrition-like label on every new smartphone like it causes cancer (which it could), but there is only so much that people can appreciate in terms of reducing their carbon footprint when the scarcity of options being advertised to them by Verizon, AT&T and T-Mobile are all gratuitously energy and application hogs. So a little more Montessori choose your own adventure, purely Plato Ideal doesn't sound so terrible to me. Sounds a lot less a walled garden of elite connections and ivy leagues getting first dibs on your Protean platform. The only thing you and Ames can criticize about privilege (tourists, white males- I have never visited Hawaii, and I probably won't) is that they tried to make a laptop for everyone, and all you care about is making a "No Tourists welcome" tweet instead of constructively criticizing Intel for their hypocritical "demo only" Claremont, which you more or less did with your own Gameboy. Back in the day, universities actually produced something-knowledge, not political ideologies, just like Julian Benda wrote in *La Trahison des clercs* in 1927. So you three have all earned the title of Trifecta of Stooges, for the Corporations, the Government, and the regulatory-captured Academia. So now you know why I believe in Edu-"ocracy", in Castalia, a fictional university land grant in Herman Hesse's 1943 *The Glass Bead Game*, the only place I can find that is above all petty conceit, arrogance, and human flaws (at least one hopes):

"Castalia is home to an austere order of intellectuals with a twofold mission: to run boarding schools, and to cultivate and play the Glass Bead Game, whose exact nature remains elusive and whose devotees occupy a special school in Castalia known as Waldzell. The rules of the game are only alluded to—they are so sophisticated that they are not easy to imagine. Playing the game well requires years of hard study of music, mathematics, and cultural history. The game is essentially an abstract synthesis of all arts and sciences. It proceeds by players making deep connections between seemingly unrelated topics.[citation needed] "

Maybe you're just corporate ~~shills~~ lizards like in the 1988 movie *They Live*.

As always and Sincerely,

Giovanni Lostumbo