A Harvard Financier, Jeffrey Epstein, Advances Artificial Intelligence in Ethiopia

By [redacted]

When it comes to Sub-Saharan Africa, the media tends to focus on war, famine and disease. How can one not, when there are still such devastating crises throughout Africa, including the horrendous Ebola epidemic in Liberia. But it's not the entirety of Africa's story by a long shot. Such is the case for Ethiopia, landlocked between Sudan, Eritrea, Djibouti, Somalia and Kenya and long eclipsed by an appalling famine and war with Eritrea. A little is popularly known perhaps about Ethiopia's splendid 12th century rock churches carved into the ground and caves in Northwest Lalibela, the plateaued Simian Mountains, the ancient city of Gondar, and of course, Lucy, its oldest hominid ambassador. But practically nothing is known about the technology emerging from its capital, Addis Ababa, and absolutely zilch about the flourishing of artificial intelligence. In fact, the computer science growth statistics for Addis Ababa sweep Silicon Valley, India and China into circuitry dust.

Nothing was certainly known to an inscrutable New York private wealth manager, Jeffrey Epstein, one of the largest investors of individual scientists around the world including Stephen Hawkins, Murray-Gell Mann, Gerard t' Hooft and a host of other Nobel Laureates. Epstein was also the financial founder of the Program for Evolutionary Dynamics at Harvard University, one of the first graduate departments to study the mathematics of evolution. A former board member of Harvard's Mind, Brain and Behavior Committee, Epstein's science foundation became increasingly involved in the marriage between neuroscience and artificial intelligence, working closely with Harvard's neuroscience branch, MIT Media Lab and MIT AI scientist Marvin Minsky. It was an impromptu meeting with computer scientist Jaron Lanier, a former graduate student of Minsky's and a pioneer in virtual reality technology that introduced the Harvard investor to the OpenCog foundation in Hong Kong and a soon-to-be extraordinary AI lab in Addis Ababa, called iCog Labs.

The founders of iCog Labs are Ben Goertzel and Getnet Assefa Gesaw. Goertzel is a magnetic AI tour de force: as Chief Financial Advisor to iCog Labs, he is the founder of the OpenCog Foundation in Hong Kong, one of the largest open source AI software providers in the world. Inspired by Linux, the global software mogul which offers cutting edge open source programming, Goertzel aspires OpenCog, to become the Linux of AI, offering free resources as a

serious alternative to major tech AI firms. On top of this, Goertzel is Chairman of AI software companies, Novamente LLC, and Biomind LLC, focusing on bioinformatic data analysis, Chairman of the AI General Intelligence Society and Vice Chairman of the technology ethics magazine Humanity +. A prolific author on everything AI, Goertzel is also the Scientific Advisor to Genescient Corporation, Research Professor in the Fujian Key Lab for Brain-Like Intelligent Systems at Xiamen University, China, general Chair of the Artificial General Intelligence conference series, an advisor to the Machine Intelligence Research Institute (formerly the Singularity Institute) and its former Director of Research.

Getnet Assefa Gezaw is an Ethiopian roboticist, a software engineer and the CEO of iCog Labs. At the impressive young age of X, he is an accomplished programmer at the Machine Intelligence Research Institute in San Francisco and Addis Ababa University. Gezaw flies between San Francisco and Addis Ababa, lecturing to hundreds of followers on robotics, AGI, self-driving cars, nanotechnology, SLAM mapping the brain and other fantastical pursuits. Similar to Goertzel, Gezaw is a big advocate of open source programming for the public, to solidify the AI field and advance independent labs, especially across Africa. Gezaw is also an advocate of DIY Bio (do it yourself biology), also known as bio-hacking or open source bioengineering, a growing movement midst maverick biotechs everywhere.

Impressed by his work, Goertzel sat down with the young Ethiopian to discuss an open source software AI lab in Africa. But what ignited this unusual Harvard, Hong Kong, Ethiopian synapse was an ambitious intellectual drive to use AI to not just emulate human cognition, but to explore cognition itself: to layout out the process of thought as much as possible, with complex, weighted, simultaneous, adaptive, machine learning algorithms and to use those models as road maps to better understand the brain's mechanism and potential. "It's a bit like building a massive airplane with no instruction manual," Jeffrey Epstein noted, (whose own plane is piloted by a svelte ex-girlfriend akin to Goldfinger). "One can only go on one's experiential sense of what an airplane should be and just keep refining it towards something beyond our imagination."

The cerebral investor, AI globalist and AI bio-hacker also share a philanthropic, democratic, trickle up ethos about providing advanced research to universities and labs in developing communities. "Developments like OpenCog and iCog spread knowledge and capability widely across the world," Goertzel remarked, "counteracting the tendency of wealth, knowledge and

influence to concentrate in particular subpopulations. As such, they seem to play a critical role in the ongoing development of the human ecosystem."

Jeffrey Epstein added, "The value of emerging markets is not just their natural resources, or relatively inexpensive labor, but the unknown resource of highly educated graduates, striving to excel. We should be encouraging these bright students to lay a true foundation for growth." In practice, Epstein's foundation funds many education and empowerment programs in impoverished communities including the US Virgin Islands, where he recently financed their largest STEM science fair recognizing hundreds of students for their work. He is also a big supporter of numerous charter schools and juvenile offender programs. In 2013, he became a substantial supporter of NeuroTV, the largest online network devoted to sharing academic discussions and university lectures on neuroscience to the public. But similar to Goertzel and Getzaw, Epstein is an outsider, in that his path is entirely self-made, unconventional and propelled by intellectual audacity. And it is very possibly this lone wolf grit that binds the three pioneers together.

iCog Labs' seed funding came from Sander Olson, a Maryland blogger at *Next Big Future*, a tech angel investor and one of the forces behind the successful 3D printing Kickstarter. Sander saw the value in low-cost AI outsourcing and was intrigued by bringing AI software development to an African country of 90 million people. However it was Epstein's ongoing funding and support of Goertzel's OpenCog Foundation in Hong Kong that helped solidify a long term edifice for the Ethiopian lab and direct it to where no brain has gone before.

The original plan for iCog Labs, located in the capital's university district of Sidist Kilo, was to have it do AI development on OpenCog projects and sustain itself with commercial outsourcing for AI projects around the world. The lab would also develop software for computational understanding of African languages (a largely uncharted territory) and African causes. Working closely with Hong Kong, iCog Labs could soon train its growing staff and by early 2014 several iCog programmers shifted to the OpenCog team in Hong Kong.

While the vast majority of African software programming focuses on everyday issues like Web development, database administration and systems integration, iCog Labs is the only firm in Ethiopia focusing on 'strong artificial intelligence' including cognitive and mobile robotics,

bioinformatics, machine learning based data analysis, computational linguistics, computer vision and cognitive architectures. More specifically, their projects include, constructing mobile robots enabled with SLAM mapping (software that constructs a map of an unknown environment based on a machine's current experiences in its physical environment), navigation ability and vision processing, deep learning algorithms for vision processing and object recognition, machine learning algorithms to predict trends in global consumption of entertainment media and automated systems to understand the English language.

On the commercial front, iCogs' is already self-supporting, with an impressive clientele spanning five continents and in such areas as natural language user interfacing for Web apps, humanoid robotics (for Hanson Robotics, makers of the Robot Einstein and other famously realistic humanoid robots), genomics of longevity, accounting automation and educational gaming. Who are some other customers? Despite this growing rolodex however, iCogs Lab continues to provide open-source programming and collaboration with Ethiopian and African governments, schools and universities such as the Addis Ababa Institute of Science and Technology.

While iCogs Lab is already looking to expand to a second branch in Hawassa, a smaller city a few hours from the capital, the road to the AI frontier was far from obvious for the little-lab-that-could. When Goertzel first met the acutely smart programmers in Addis, none of them knew that much about AI, nor the modern, agile software development process or use of open source tools like Github—so a lot of training was required. Day to day issues typical of developing countries, were also problematic such as poor roads, shoddy electrical, cell tower and wifi systems, laborious and expensive tariff policies and other tribulations that are often taken for granted. But none of these hurdles have been insurmountable for the resolute lab.

The climate for AI development in Ethiopia is also ripe. By now, South Africa, Kenya and Nigeria all have burgeoning software startup ecosystems. IBM recently put Watson supercomputers in Nairobi, Lagos and Capetown and while Ethiopia's software industry is less mature, it is rapidly expanding. Ethiopia is now the third fastest growing country in the world, and the fastest growing African nation. There are currently two dozen small software outsourcing firms in Addis Ababa, serving a wide array of customers across Africa and the world. Their software market has doubled in the past three years and the Ministry of Trade and Industry affirms more than 700 licensed companies in computer technology and 95 software and

computer networking businesses. To back this up, an astounding 95% of its youth graduate from primary school, 60-70% from high school, and there are almost 100 universities across Ethiopia.

And as the world slowly becomes more developed from the grass roots up, versus haphazardly from the top down, the Harvard, Hong Kong, Ethiopian synergy offers an inspiring model especially in the idealistic, deeply intellectual world of artificial intelligence. The effort is invigorating thousands of African students to participate in an exciting global exploration, creating communal prosperity and setting the stage for the next frontier: a journey to the center of the brain.