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One Billion

People, Ten Years, Positive Change = 10⁹+

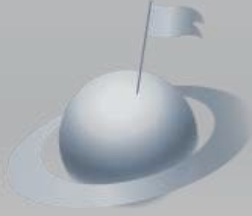
The Team Project for SU's Graduate Studies Program is the centerpiece of the curriculum where students are given a challenging, interdisciplinary, and real world problem that exemplifies one of humanity's grand challenges. Team Projects are called 10⁹+ (ten to the ninth, plus), meaning that students will be asked how they can impact 1 Billion people, worldwide, in a positive way, within 10-years time leveraging accelerating technologies.

At the end of the 10 week summer session, students will present their results before a panel of individuals composed of representatives from private and public industries. They will also launch a website and other deliverables to serve as a launchpad for practical solutions and continued international dialogue related to various aspects of the problem.

GSP11 Grand Challenge Areas

Space

The grand challenge of space includes abundant energy and material resources, a planetary-scale network of sensors and systems measuring global conditions, and a vast, open frontier for exploration – but humans haven't yet built industrial-strength solutions to realize these opportunities rapidly and cost effectively. How can the vast and abundant energy and material resources of space be used to address many of humanity's grand challenges?



Energy

Our civilization fundamentally depends on energy, and we need to make a rapid transition from low-efficiency systems and high dependence on fossil fuels, to high efficiency systems and cost-effective renewable fuels. How can exponential technologies be used to provide humanity with low-cost and abundant energy to meet their needs for prosperity?



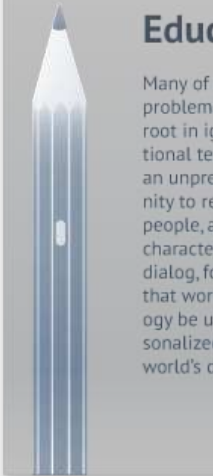
Security

In a world plagued by wars, terrorism, and crime, nations seek many different kinds of security for their citizens, as well as freedom from fear and corruption. How can exponential technology be used to address and improve global security issues?



Education

Many of the world's critical problems have a common root in ignorance, and educational technologies provide an unprecedented opportunity to reach billions of people, and build a future characterized by informed dialog, foresight, and systems that work. How can technology be used to provide personalized education to the world's developing areas?



Global Health

There are large and growing discontinuities between current knowledge of public health and medicine and its effective application around the world – millions suffer and die from preventable diseases, and the entire world remains at risk of pandemics. How can technology be used to provide billions with low-cost, ubiquitous healthcare, and help to identify and prevent pandemics?



Poverty

Living standards have increased significantly in the past two centuries, but more than 20% of the world today lives in extreme poverty – unable to access resources that address their problems. How can exponential technologies be leveraged to create new jobs and wealth to alleviate poverty?



Past Project Areas

Sustainable Water

The crisis in water and sanitation is one of the greatest human development challenges according to the UN and NAE. More people die from the lack of clean water than war. At the same time, water needs of agriculture and industry are 20 times larger than personal water usage. What are the holistic alternatives to capital-intensive infrastructures which will address our needs for clean water?



Food for Cities

By the year 2050, population is expected to grow by another 3 billion and nearly 80% of the total population will reside in urban centers. In order to feed the increase in population, an estimated 109 hectares of new land (about 20% more land than is represented by the country of Brazil) will be needed to grow enough food if traditional farming continues as it is practiced today. How can technologies be leveraged to increase the efficiency of large-scale food production without sacrificing our delicate ecosystems?



Upcycle

In the next decades, the amount of products that humans use and discard will grow exponentially. In order to us to make significant reductions in CO2 emissions and environmental contamination, we have to rethink how we make and use things. How do we re-purpose, re-process, or re-manufacture waste into new, useful products? What is a systematic approach to product design to ensure that landfills aren't needed in the first place?



Past Projects

GSP10

Food



Food: Agropolis aimed to put hydroponics and vertical farming to work on a local scale. The project dealt with producing little modules that could be decentralized. One potential application would be to grow produce as well as farm-bred tilapia fish and bioengineered meat inside a multistory building, and sell the foodstuffs at a market located in the same building.

Energy



Energy: Amunda, which would seek to set up small-scale markets in energy for the developing world. Their application for sharing data about customers and suppliers of energy would guide entrepreneurs in finding the optimum power generation solution for their particular region.

Water



Water: One team project, dubbed Naishio, would enlist converging technologies (bio plus nano plus solar) to desalinate seawater more efficiently. Another venture called Sensoria focused on biology-based sensor technologies to test water purity.

Space



Space: AI Labs was a proposed R&D firm to apply general artificial intelligence to increasingly autonomous tele-operated robots and synthetic biology to help create survivable environments, overcome disease and aging, and extend human presence in space. SpaceBio Labs strove to provide cheap and easy access to highly functional biological experiments in space on automated platforms that are reliable for long duration experiments.

Upcycle: The Fre3dom team worked on a 3-D printing process that would allow local communities in the developing world to make their own spare parts for broken-down equipment using bio-plastic. Another team tried to create more efficient markets for products that one company might see



GSP09

The ACASA team project examined how these exponentially growing technologies could be applied to the problem of sub-standard housing, concluding that advances in 3D-printing and Rapid Additive Manufacturing (RAM) technologies could be used to construct customizable, affordable, and environmentally sustainable homes.



OneGlobalVoice is a development platform that gives access to cloud-computing resources through SMS on a basic (2G) cellphone. It demonstrates how innovations commonly carried out on computationally-and-bandwidth heavy internet subscriptions, or on fast and relatively expensive 3G networks (available to less than a quarter of mobile subscribers worldwide) can also take place on the 2G networks available to over half the world's population.

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