



SUSTAINABLE CITIES

Collaborative Field Course in Brazil

January 11th to 21st, 2015
São Paulo



Caros Participantes (Dear Participants),

Sejam bem-vindos! We are delighted to welcome you to the sixth edition of the collaborative Harvard/Poli-USP environmental engineering field course, a joint effort of Harvard University's School of Engineering and Applied Sciences (SEAS), the Escola Politécnica da Universidade de São Paulo (Poli-USP) and the Brazil Office of Harvard's David Rockefeller Center for Latin American Studies (DRCLAS). The focus of this year's course is "Sustainable Cities."

We will have the unique opportunity to learn in the field from professors and senior practitioners who are simultaneously receiving us while facing the greatest challenges in decades to the sustainability of São Paulo, South America's largest city. São Paulo is in the midst of the most severe water crisis in 80 years. Historically low reservoir levels are not only cause for concern for the metropolitan area's 20 million consumers at the kitchen sink, they are also a serious problem for companies focused on electricity generation and distribution. As you participate in the course, residents and policy leaders will be praying to "São Pedro" (the rain Saint) while motorists will be monitoring rainfall and wishing away flash floods that add to the ever-increasing amount of time *Paulistanos* spend in traffic. We will meet with entrepreneurs from the private and not-for-profit sectors who have created innovative solutions to help address these problems in collaboration with public policy leaders and government administrators.

This course is designed to enable students to get to know course faculty in a way that is impossible during standard, term-time classes. Take advantage of the opportunity. In response to positive feedback from previous course participants, we have given even greater emphasis to site visits this year. We will explore the largest water reuse project in the Southern Hemisphere; the Operational Control Center of São Paulo's modern, busy, and too-small-for-existing-demand metro system; the Emergency Management Center for forecasting and monitoring of the city's weather; the University of São Paulo's Photovoltaic Systems Laboratory; the Cantareira system of five interconnected reservoirs that serve 9 million city inhabitants; and the first manufacturer of large wind turbines in South America.

While all participating professors believe deeply in the course and have embraced the opportunity to spend what otherwise could have been time for personal research or family with you, the ball is in your court. Swing for the fences or *chuta para o gol*. Recognize that course professors, guest lecturers and organizers are as interested in learning as you are and are happy to learn from you! We have a wonderfully diverse group, as you will read in the course bios.

To all who contributed to the creation and execution of this collaborative field course, particularly Manoel Pereira Neto, please know that we are deeply grateful. This initiative would not have been possible without the vision and support of many individuals and institutions in Brazil and the United States. We appreciate the ongoing engagement and support of the Dean of the Poli-USP. We thank Harvard faculty for coming to Brazil and for their interest in helping to open labs to exceptional students and young researchers in Cambridge and Boston. Finally, we would like to express our sincere appreciation to Claudio Haddad, and the Lemann Foundation without whom none of this would be possible. *Muito obrigado!*

Grande abraço,



Monica Porto

Full Professor and Chair, Department of Hydraulic and Sanitary Engineering, Escola Politécnica da Universidade de São Paulo (Poli-USP)



Chad Vecitis

Assistant Professor of Environmental Engineering, Harvard School of Engineering and Applied Sciences (SEAS)



Jason Dyett

Program Director, Brazil Office Harvard University David Rockefeller Center for Latin American Studies (DRCLAS)

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ACADEMIC HOST INSTITUTIONS

HARVARD'S SCHOOL OF ENGINEERING AND APPLIED SCIENCES (SEAS)

Harvard University's School of Engineering and Applied Sciences (SEAS) serves as the connector and integrator of the University's teaching and research efforts in engineering, applied sciences, and technology. Its core tenets are educating broad-minded students; interdisciplinary research; integration across disciplines; and balancing theory, experimentation, and practice. SEAS offers undergraduate concentrations in Applied Mathematics, Biomedical Engineering, Computer Science, Electrical Engineering, Engineering Sciences, and Mechanical Engineering and graduate programs (S.M., M.E., and Ph.D.). Graduate students may work towards a Master's of Science (S.M.), Master's of Engineering (M.E.), and Doctor of Philosophy (Ph.D.) degree in Applied Mathematics, Applied Physics, Computational Science and Engineering, Computer Science, Bioengineering, Electrical Engineering, Environmental Science and Engineering, Mechanical Engineering (including a Materials Science track), and Secondary Field in Computational Science and Engineering (as part of the Ph.D.). Faculty who have particularly close ties with the departments of Physics, Earth and Planetary Science, and Chemistry and Chemical Biology number approximately seventy. Over the past decade, undergraduate enrollments in Applied Mathematics, Computer Science, and Engineering Sciences have ranged from 300 to over 500. For additional information, please see: www.seas.harvard.edu.

UNIVERSIDADE DE SÃO PAULO'S ESCOLA POLITÉCNICA (Poli-USP)

The University of São Paulo (USP) is the largest institution dedicated to higher education and research in Brazil, with nearly 90,000 students. It is highly acclaimed around the world, especially in Latin America, and is responsible for training a large part of Brazilian academics working in colleges, universities and research institutes. USP is a public university, free of charge and with open access for students selected by the *vestibular* (Brazilian admissions exam for universities). It is composed of 48 educational and research units, five hospitals, five museums, five specialized institutes, multiple experimental laboratories as well as scientific and cultural centers spread across seven campus locations. The primary campus in metropolitan São Paulo houses the Escola Politécnica (Poli-USP), which has fifteen departments and over 100 laboratories. Founded in 1893, the Poli was incorporated into the Universidade de São Paulo in 1934. Poli-USP has 336 full time faculty and offers undergraduate (4,557 students), master's, doctoral (1,574 students) courses and degrees. For additional information, please see: www.poli.usp.br.

HARVARD'S DAVID ROCKEFELLER CENTER FOR LATIN AMERICAN STUDIES (DRCLAS)

The David Rockefeller Center for Latin American Studies (DRCLAS) is one of 11 inter-faculty initiatives at Harvard University and is overseen by the Office of the University Provost, with an administrative home in the Faculty of Arts and Sciences (FAS). DRCLAS was founded in 1994 as an initiative to promote high-quality teaching and research on Latin America and related fields at Harvard University. The mission of the DRCLAS Brazil Office in São Paulo and Brazil Studies Program in Cambridge is to enhance collaborative research among Harvard faculty and their Brazilian counterparts; encourage faculty engagement with Brazil and student participation in language programs, internships and research projects in Brazil; and provide a hospitable environment for Brazilians at Harvard and for Harvard scholars in Brazil. Since the launch of the Brazil Office in June 2006, more than 200 Harvard faculty have traveled to Brazil and over 1,100 students have engaged in and with the country across a range of disciplines with support or involvement of the Office. For additional information, please see: brazil.drclas.harvard.edu.

COURSE SCHEDULE



Sunday, January 11th – São Paulo

Morning **International student arrivals** – *Harvard's David Rockefeller Center for Latin American Studies (DRCLAS) Brazil Office staff will await international participants at São Paulo GRU International Airport arrivals area.*

Afternoon **Hotel check-in for all participants.** Rest and time to meet others.

7:30 pm **Informal welcome dinner.**

Monday, January 12th – São Paulo

8:30 am **Depart hotel.**

9:00 – 10:15 am **Welcome and Collaborative Course Introductions and Overview.**

10:30 – 11:45 am **Bus tour of USP Cidade Universitária and Poli-USP.**
This tour will focus on general orientation around the Poli-USP and the Cidade Universitária. Led by Poli-USP students.

11:45 am – 1:15 pm **Lunch.**

2:00 – 3:30 pm **Lecture & Discussion: Urban Sustainability - Challenges & Opportunities for São Paulo.**
Miguel Bucalem, Full Professor at the Department of Geotechnical and Structural Engineering, Poli-USP; Former Municipal Secretary for Urban Development of São Paulo.

3:45 – 5:15 pm **Lecture & Discussion: Intelligent Buildings.**
Roberto Oranje, Engineering Coordinator, Banco Santander.

5:15 – 5:45 pm **Tour of Santander Tower.**
Torre Santander, the administrative headquarters of the bank, is internationally recognized as an eco-efficient building.

5:45 pm **Return to hotel.**

Evening **Free.** Students encouraged to get to know other members of their groups.

Tuesday, January 13th – São Paulo, Campinas & Sorocaba

8:00 am **Depart** hotel.

10:00 – 11:45 am **GE Wind Power Company.**
GE Energy Management develops solutions and technologies for customers in electric power generation, processing, conversion, transmission, distribution, protection, monitoring and control.

12:00 – 1:00 pm **Lunch.**

2:30 – 4:00 pm **Site Visit: Wobben Wind Power Company.**
Wobben Wind Power is the first manufacturer of large wind turbines in South America. It was created to produce wind power components and turbines for the domestic and international markets, in addition to designing, installing, operating and providing technical assistance to wind farms.

4:15 pm **Return** to hotel. Estimated arrival: 5:30 pm.

Evening **Free.** Students encouraged to make progress on team projects.

Wednesday, January 14th – São Paulo

8:30 am **Depart** hotel.

9:30 – 11:30 am **Site Visit: Centro de Gerenciamento de Emergências – CGE/CET.**
The Emergency Management Center (CGE) is the organization responsible for the forecast and weather monitoring of the São Paulo City.

12:00 – 1:30 pm **Lunch.**

2:00 – 3:45 pm **Lecture & Discussion: The Battle of the Bike: 2 wheels vs. 4.**
Ricardo Young, City Councilor of São Paulo.

4:30 – 6:00 pm **Site Visit: Centro de Controle Operacional do Metrô – CCO.**
The Operational Control Center (CCO) is responsible for the operations of São Paulo's subway system that transports about 3.8 million daily.

Evening **Free.** Students encouraged to make progress on team projects.

Thursday, January 15th – São Paulo

8:30 am **Depart** hotel.

9:30 – 11:30 am **Site Visit: Aquapolo Ambiental.**
Aquapolo is the largest water reuse project in the Southern Hemisphere, and the fifth largest of its kind in the world.

12:00 – 1:45 pm **Lunch.**

- 2:00 – 5:30 pm** **Sharp & Eliseu de Almeida Retention Ponds**
 Together Sharp & Eliseu de Almeida Retention Ponds have the capacity to accumulate over 600,000 cubic meters of water, helping to control flooding streams in Pirajussara’s river basin.
- 5:30 pm** **Return** to hotel.
- 6:00 – 7:30 pm** **Dinner & Discussion of group research themes** for each student working groups. Course faculty will provide information to help students progress in their thinking on the program.

Friday, January 16th – São Paulo & Nazaré Paulista

- 8:30 am** **Depart** hotel.
- Morning & Afternoon** **Site Visit: Sistema Cantareira – Atibainha Reservoir.**
 Sistema Cantareira is a water supply system in the state of São Paulo composed by five interconnected reservoirs that provide water to 9 million people in the São Paulo metropolitan area.
- Evening** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Saturday, January 17th – São Paulo

- 9:00 – 11:30 am** **Site Visit: Tower Bridge Corporate – Intelligent Building.**
 Tower Bridge Corporate is a LEED-certified office complex totaling 605,400 square feet area in São Paulo, and is registered with the certification goal of LEED® Gold for Core & Shell™.
- 12:00 – 1:00 pm** **Lunch.**
- 1:00 – 3:00 pm** **Discussion of group research themes** for each student working groups. Course faculty will provide information to help students progress in their thinking on the program.
- Late Afternoon & Evening** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Sunday, January 18th – São Paulo

- All Day** **Free.** Students from Harvard & Brazil encouraged to have joint informal activities/outings.

Monday, January 19th – São Paulo

- 8:45 am** **Depart** hotel.
- 9:30 am – 12:30 pm** **Roundtable: Breathing and Moving - Technology, Transport, and Air**
 Karena McKinney, Lecturer and Fellow in Environmental Science and

Engineering, Harvard's School of Engineering and Applied Sciences.

Paulo Artaxo, Full Professor and Chair of the Department of Applied Physics, University of São Paulo's Institute of Physics.

Ciro Biderman, CEO, SPTrans; Professor of Public Administration and Economics, Fundação Getúlio Vargas (FGV); Affiliated Researcher, Department of Urban Studies and Planning, Massachusetts Institute of Technology (MIT);

Paulo Saldiva, Professor of Pulmonary Pathology and Chair, Department of Pathology, University of São Paulo Medical School (FMUSP).

12:45 – 2:15 pm

Lunch.

2:30 – 5:30 pm

Lecture & Site Visit: Green Infrastructure: How to Better Negotiate with Nature.

Paulo Pellegrino, Professor of Landscape Architecture and Planning, Department of Design, School of Architecture and Urbanism of the University of São Paulo (FAUUSP) &

Claudia Visoni, Founder, Conectar Comunicação.

5:30 pm

Return to hotel.

Evening

Group Dinner.

Tuesday, January 20th – São Paulo

8:30 am

Depart hotel.

9:15 – 10:15 am

Lecture & Site Visit: Solar Energy Facilities at USP.

Professor Roberto Zilles, Associate Professor, Department of Electrical Engineering, Poli-USP.

10:30 – 11:45 am

Site Visit: Programa de Uso Racional da Água – PURA.

The mission of the University of São Paulo's PURA program is to increase social responsibility related to rational use of water.

12:00 – 1:15 pm

Lunch.

2:30 – 5:00 pm

Entrepreneurship & Elevator Pitches: Building Better Cities

Hosted by the Lemann Foundation, a non-profit that is using innovative approaches to education to pursue its mission that every student in Brazil learns.

2:30 – 2:45 pm

Welcome & Overview.

2:45 – 3:15 pm

Endeavor and Entrepreneurship in Brazil – Letícia Queiroz.
Social Entrepreneurship – Mara Mourão.

3:15 – 3:45 pm

5-minute Elevator Pitches:
Alberto Bueno Jr. – Profes

Allan Kajimoto – Kekanto
Claudio Sasaki – Geekie
Josué Alencar & Co-Founder – Olhos da Cidade
Thomas Srougi – Dr. Consulta

3:45 – 4:15 pm Q&A & Group Discussion – all groups.

4:15 – 5:00 pm Ask an Entrepreneur: Conversation with presenters in teams.

5:15 pm **Return** to hotel.

Evening **Free.** Prepare for final presentations (they will be filmed and the winning team rewarded).

Wednesday, January 21st – São Paulo

8:30 am **Depart** hotel.

9:00 – 10:30 am **Online course evaluation.**

10:45 am – 1:00 pm **Group presentations.**

1:00 – 2:30 pm **Closing lunch.**

Evening **Departure** of all international participants.

FACES & NAMES OF PARTICIPANTS

COURSE FACULTY & ORGANIZERS

From Harvard



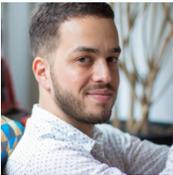
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Jill Larson
Area Director
for Environmental Sciences
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From Poli-USP



Monica F. A. Porto
Full Professor and Chair,
Department of Hydraulic and
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José Carlos Mierzwa
Associate Professor of
Environmental Engineering and
Water Treatment



Maurício Salles
Assistant Professor,
Department of Electric Energy
and Automation Engineering



Miguel Bucalem
Full Professor,
Department of Geotechnical
and Structural Engineering

GUEST LECTURERS



Alberto Bueno Jr.
CEO, Profes



Allan Kajimoto
CPO & Co-Founder,
Kekanto



Ciro Biderman
President, SPTrans;
Professor, Fundação Getúlio
Vargas



Claudia Visoni
Founder
Conectar Comunicação



Claudio Sasaki
Founder, Geekie



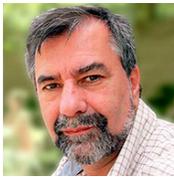
Josué Gomes Alencar
Co-Founder, Olhos da Cidade



Letícia Queiroz
Director of Support to
Entrepreneurs, Endeavor



Mara Mourão
Founder, MAMO Filmes;
Director, “Quem se Importa”



Paulo Artaxo
Professor, Instituto
Astronômico e Geofísico da
Universidade de São Paulo



Paulo Saldiva
Full Professor, Department of
Pathology, Faculdade de
Medicina da Universidade de
São Paulo



Paulo Pellegrino
Professor of Landscape
Architecture and Planning,
Faculdade de Arquitetura e
Urbanismo da Universidade de
São Paulo



Ricardo Young
City Councilor, São Paulo



Roberto Oranje
Engineering Coordinator,
Banco Santander



Roberto Zilles
Associate Professor,
Department of Electrical
Engineering, IEE-USP



Thomaz Srougi
Founder, Dr.Consulta

STUDENTS

From Harvard



Adrian Jones
Harvard College, Class of 2016
S.B. in Electrical Engineering



Anastasiya Borys
Harvard College, Class of 2015
S.B. in Computer Science



Avinash Saraf
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A.B. in Social Studies
(secondary in Computer
Science)



Debbie Onuoha
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Deng-Tung Wang
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and Environmental Engineering



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A.B. in Social Anthropology and
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Joanne Ngheim
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From Poli-USP



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Rodrigo Kleinert
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Vinicius B. Pietrantonio
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Nicolas Chavez
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Yolanda de Almeida Santos
5th-year Undergraduate Student
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Poli-USP

COURSE LOCATIONS

Brazil

With a population of over 200 million, Brazil is the fifth most populous country in the world and its fourth largest democracy. After decades of military rule that ended in 1985, Brazil has evolved into a vibrant, open society with an active press and established media freedoms. Since the mid-1990's it has enjoyed macroeconomic stability and a stronger middle class.



Brazil has the world's largest reserves of tropical forest, freshwater and of bio-diversity. It is the country outside of the G8 with the strongest science base, as measured by the frequency of quotations in scientific papers. Brazil plays an active role in international negotiations on climate change and has been prominent in building partnerships on biofuels.

The country has expanded its presence in international financial and commodities markets, and is one of a group of emerging BRIC economies. Brazil is, and has been for the last 150 years, the world's largest producer of coffee. It is the fourth largest car market in the world. Major exports include

aircraft, electrical equipment, automobiles, ethanol, textiles, footwear, iron ore, steel, coffee, orange juice, soybeans and corned beef.

Brazil is at the forefront of efforts to deepen Latin American integration. It founded and plays a coordinating role in the G20 group of nations in WTO negotiations. Brazil is an active member of the United Nations, and has for several years led the UN peacekeeping force in Haiti (it was the first country to contribute to the Haiti Reconstruction Fund). Under President Lula (2002-2010) and the current President Dilma Rousseff, the country's first female president, Brazil has worked in closer coordination with emerging powers, particularly India, South Africa, China and Russia. Brazil has encouraged closer co-operation between Latin America and the Middle East. Africa has also been a stated priority of President Rousseff's administration. President Rousseff was narrowly re-elected to a second term in October 2014.

Slightly larger than the continental United States, Brazil borders nine countries in South America. It is comprised of 26 states and the Federal District, Brasília. States have considerable autonomy, being responsible for such issues as security and education. The majority of the population lives in coastal states, particularly in the southeast, which includes the cities of São Paulo and Rio de Janeiro. The country is framed by two of the world's largest river systems: the Amazon in the North, and the Paraná river in the South. The Amazon basin covers some 60% of Brazil's surface, and holds 20% of the world's fresh water supply. In addition to rain forests, Brazil has savannah and wetlands.

São Paulo, São Paulo

São Paulo is the most populous city in the southern hemisphere and capital of the state of São Paulo. While the city proper's population is approximately 12 million, the greater metropolitan area is home to approximately 21 million inhabitants, making it one of the most populous in the world. Metropolitan São Paulo's GDP accounts for approximately 12% the country's total economic output. The city is home of the Bovespa, the largest stock exchange in Latin America. The State of São Paulo is a major supplier of consumer goods, capital goods, consumer materials and services to other Brazilian states and to foreign countries.

São Paulo is a melting pot of nationalities, cultures, beliefs, philosophies and ideals. It is Italian, German, Jewish, Portuguese, Japanese, Chinese, French, African, Arab, Spanish, Latino, Brazilian and Paulistano. The city brings together approximately 3 million people of Portuguese descent, 3 million of Italian descent, 1.5 million of African descent, 1 million of German descent, 850 thousand of Lebanese descent and more than 1 million people of Japanese descent (it is the largest Japanese city outside of Japan).

The sixth edition of Harvard's SEAS and Poli-USP Collaborative Field Course will take place in the São Paulo, with a few site visits taking place in other cities in the interior of the state.

SITE VISITS

On behalf of all its participants, the course organizers would like to thank the tremendous generosity, openness and hard work of the many institutions and individuals who have made the following field site visits possible. We appreciate your contributions and recognize that you are integral to this collaborative course's existence and success.

AQUAPOLO AMBIENTAL

The State of São Paulo contains nearly one-fourth of the country's population but less than 2% of Brazil's water. The state government, recognizing the importance of safeguarding drinking water, issued regulations to restrict the industrial use of potable water, forcing factories to look for ways to reuse their wastewater, or obtain recycled water from other sources. The Aquapolo Ambiental water reuse venture was created to address these new regulations. Aquapolo is the largest water reuse project in the Southern Hemisphere, and the fifth largest of its kind in the world. It was created by Foz do Brasil (Odebrecht) and Sabesp, a Brazilian state-owned utility that provides water and sewage services for residential, commercial, and industrial use in the state of São Paulo. Aquapolo supplies the Capuava Petrochemical Complex of Mauá, located in São Paulo's metropolitan area, which conserves enough drinking water to continuously supply a population of 300,000 people.

CENTRO DE CONTROLE OPERACIONAL DO METRÔ - CCO

São Paulo's subway system transports 3.8 million people daily. The Operational Control Center (CCO), comprised of technicians and computer systems, manages the entire subway network. CCO monitors system-wide performance, including intervals between trains. It monitors power usage and oversees all stations and network equipment. Telephone and radio systems connect to the CCO and its operational staff at subway stations, in trains, and at control towers of parking lots.

The system is capable of full automation. In this mode (Automatic Train Operation), movement of trains is controlled entirely by computers. Systems security, however, does rely on the experience and skill of human operators, particularly in any abnormal cases, such as the presence of an obstacle on the tracks or in cases when passengers or objects get stuck in train doors. There are two other system operation modes: semi-automatic and manual. In the semi-automatic mode, braking, acceleration and door controls are managed by the operator. Control of train movement continues to be based on the signaling system. Different tools control the speed, maintaining a minimum distance between trains to prevent collisions. If the speed limit is exceeded, automatic braking is triggered. In emergency cases, manual operation is used. The operator controls the movement of trains, receiving radio guidance from CCO. In such cases, traffic speed is limited to 30 km per hour.

CENTRO DE GESTÃO DE EMERGÊNCIAS - CGE

The Emergency Management Center (CGE) is the organization responsible for weather forecasting and monitoring in the City of São Paulo. It was established in 1999 after a massive flood in the Anhangabaú tunnel, one of the city's busiest. Many cars were submerged in the tunnel. Shortly after the flood, the CGE began its efforts to minimize the effects of heavy rains in São Paulo, which typically occur between November and mid-April.

The Emergency Management Center is part of the Center for Traffic Engineering (CET). CGE was inspired in predictive models in other world capitals. Its location within CET provides CGE easier access

to flood event and other information relating to rainy days, thanks to CET's network of surveillance cameras and agents who monitor traffic. In addition to the valuable field information provided by CET, CGE has access to weather radar systems, rain gauges, and real-time data from the telemetric network measurement stations installed in the city's rivers. Over the last 15 years, CGE has developed an extensive database that serves its own team, City Hall, and researchers from several universities. The Center maintains data related to rainfall, temperature, air humidity, flooding occurrences, and other survey information. It is operated by the Center for Hydraulic Technology (FCTH) of the University of São Paulo (USP).

GE ENERGY MANAGEMENT

GE Energy Management develops solutions and technologies for customers in the areas of electric power generation, processing, conversion, transmission, distribution, protection, monitoring and control. The business unit, which has more than 26,000 employees around the world, is divided into four lines of business: Digital Energy, Industrial Solutions, Intelligent Platforms and Power Conversion. Since 1962, GE Energy Management has had a plant in Campinas, a city 60 miles north of São Paulo, which manufactures induction motors and medium voltage generators used in almost 30% of the industries in Brazil. GE Energy Management also has a factory of circuit breakers in Contagem (state of Minas Gerais), a unit of GE Power Conversion, which manufactures electrical panels and medium and low voltage converters in Betim (Minas Gerais), a training center and office in Macae (Rio de Janeiro), and offices in Vitória (Espírito Santo) and Parauapebas (Pará).

LABORATÓRIO DE SISTEMAS FOTOVOLTAICOS DO INSTITUTO DE ELETROTÉCNICA E ENERGIA DA UNIVERSIDADE DE SÃO PAULO - LSF-IEE

The Photovoltaic Systems Laboratory of the Electrical and Energy Institute at the Universidade de São Paulo (LSF-IEE) is an accredited laboratory for the evaluation of photovoltaic modules in Brazil. Its facilities include a solar simulator, a climate chamber, and a salt spray chamber, which allow testing of modules within the Brazilian Labeling Program (PBE) of the National Institute of Measurement, Standardization and Industrial Quality (INMETRO). Additional fields of research include network connected photovoltaic systems, rural electrification, and power storage for photovoltaic pumping systems and for ice production systems.

PROGRAMA DE USO RACIONAL DA ÁGUA - PURA

The mission of the University of São Paulo's Program for Rational Use of Water (PURA) is to build social responsibility. In recent months, studies disclosed in the press have shown disturbing predictions about the availability of water in the near future. Rational use seeks to avoid wasting resources through the optimization of equipment, changing habits of users, and combating losses. Rationing, on the other hand, does so by imposing quotas. The PURA program aims to minimize water consumption at the University without reducing the quantity and quality of University activities. By changing habits and creating community awareness, PURA's optimization efforts are intended to have a sustained impact. In contrast, the imposition of water rationing implies that it is temporary in nature.

SANTANDER TOWER

The Santander Group is a Spanish banking group centered on Banco Santander, S.A. and is the largest bank in the Eurozone by market value. Its Brazilian subsidiary, Banco Santander Brasil, was founded in São Paulo in 1982.

One of Santander's areas of activity is the application of sustainable construction in its projects and company buildings. In this way, the bank not only reduces the environmental impact of its branches and

administrative buildings, but also incentivizes its employees to adopt sustainable practices to protect the environment. The Santander Tower, the bank's administrative headquarters, located in São Paulo, is an eco-efficient building recognized for its initiatives in five main areas: local sustainable development, rational water use, energy efficiency, material selection, and internal environment quality.

In December 2010 the Tower received the Leadership in Energy and Environmental Design – Core and Shell (LEED – CS), gold category. This seal of approval, given by the American NGO U.S. Green Building Council (GBC), is internationally recognized in the sustainable construction field.

SHARP & ELISEU DE ALMEIDA RETENTION PONDS

Retention ponds, popularly known in Brazil as “piscinões” (big pools), are structures that retain rain water in order to prevent flooding caused by heavy rain in urban areas. They are considered a relatively economic short-term alternative when compared to other methods of urban drainage. The Sharp retention pond is the second largest in the São Paulo metropolitan area. It covers 94,000 square meters and has the capacity to accumulate 500,000 cubic meters of water, helping to control flooding in the Pirajussara river basin. The Eliseu de Almeida flooding control reservoir, which has capacity to accumulate 113,000 cubic meters of water, was created in the same basin.

SISTEMA CANTAREIRA – ATIBAINHA RESERVOIR

The Sistema Cantareira is a water supply system in the State of São Paulo comprised of five interconnected reservoirs that, together, provide water to 9 million inhabitants of metropolitan São Paulo. Our visit the Atibainha reservoir will enable us to see these interconnected reservoirs that are controlled by Sabesp, São Paulo's state water management company. By 1960, São Paulo's state government had become concerned with high population growth. At that time, the metropolitan areas population had grown to 4.8 million inhabitants. As a result, the State decided to increase water supply in the metropolitan region. It built several reservoirs in the headwaters of the Piracicaba River basin, thus beginning Cantareira System. In 2014, low rainfall in the state of São Paulo led to a severe drought. The Cantareira system's water level has fallen constantly, leading to water shortages in many areas of the city. In an effort to address the problem, Sabesp has reduced water pressure to residences, offered a bonus for customers who save water and is increasingly tapping ground water sources.

TOWER BRIDGE CORPORATE

Tower Bridge Corporate is a LEED-certified office complex totaling 605,400 square feet area in São Paulo, and is registered with the certification goal of LEED® Gold for Core & Shell™.

WOBLEN WIND POWER

Wobben Wind Power is the first manufacturer of large wind turbines in South America. It was created to produce wind power components and turbines for domestic and international trade, in addition to designing, installing, operating and giving technical support to wind farms. It is a subsidiary of ENERCON GmbH, a world-leading company in wind power technology. Wobben was the first independent manufacturer to be regulated by ANEEL, Brazil's Electricity Regulatory Agency. ENERCON, Wobben's holding, has supplied 40 countries with over 21,000 wind turbines, totaling energy generation of more than 30,000 MW. The company's first factory in Sorocaba, São Paulo has been in full operation since 1995. Different models of ENERCON wind turbines are manufactured in its plants, such as E-44 900 kW, E-48 800 kW, E-70 2,300 kW, E-82 from 2,000 to 3,000 kW and E-92 2300 kW. In February of 2002, Wobben significantly increased its production capacity with a new plant located in Pecém, in Brazil's northeastern state of Ceará. In 2010, Wobben started building its third manufacturing plant, also in the northeast. They are responsible for creating 1,400 direct and 4,000 indirect job opportunities in the field of wind power.

WORKING GROUPS & FINAL PRESENTATIONS

The following guide for final presentations is designed to drive the discussion and learning of students during the course. Students will be divided in the following five sub-groups:

DISTRIBUTED ENERGY RESOURCES (DER)



Adrian Jones



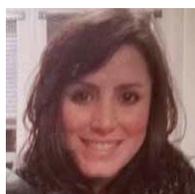
André Alves



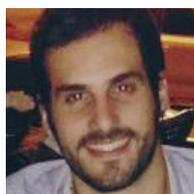
Avinash Saraf



Jabred Liddie



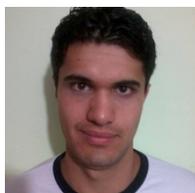
Layla Nunes



Vinicius B. P.

Distributed Energy Resources refers to a variety of small, modular power-generating technologies that can be combined with load management and energy storage systems to improve the quality and/or reliability of the electricity supply. They are “distributed” because they are placed at or near the point of energy consumption, unlike traditional “centralized” systems, where electricity is generated at a remotely located, large-scale power plant and then transmitted down power lines to the consumer.

URBAN WATER USE, DEMAND MANAGEMENT AND WATER REUSE



Bruno Musso



Debbie Onuoba



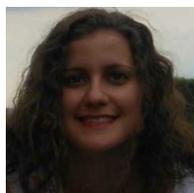
Deng-Tung Wang



Eloi Ferracioli



Joanne Ngheim



Natália R.

Water is an important aspect of urban sustainability. Water consumption must be reduced in homes, businesses, public areas, irrigation systems, cooling towers and other urban applications. This can be achieved through several approaches: reducing water losses in the distribution network, using bathroom and kitchen fixtures that are more efficient, and water reuse and recycling.

SUSTAINABLE CONSTRUCTION, GREEN BUILDINGS, INTELLIGENT BUILDINGS



Anastasiya Borys



Danilo Cançado



Johnathan Budd



Mariana Omote



Nick Chavez



Yolanda Santos

Sustainable construction aims at reducing the environmental impact of a building over its entire lifetime, while optimizing its economic viability and the comfort and safety of its occupants. Green buildings refer

to structures and uses that are environmentally responsible and resource-efficient throughout a building's life cycle.

EXTREME EVENTS: FLOODS, DROUGHTS AND OTHER EXTREME METEOROLOGICAL EVENTS



Débora C. Jenny Fung Katja Lierhaus Leonardo Fiocca Luis Strengari Mark Ashby

Extreme events (floods, droughts, hurricanes) cause severe impact in urban areas. Cities must be planned and managed to be resilient in order to protect people and businesses. Potential adaptations needed to support different systems must be studied: transportation, energy, buildings, water supply and sanitation, medical and emergency facilities.

URBAN MOBILITY



Joseph Lanzillo Kristen Faulkner Mayra Martinez Rafael Amaral Ricardo Lisboa Rodrigo Kleinert

Sustainable urban mobility solutions require more efficient, greener, user-friendly and better-organized transportation systems. These systems are comprised of a range of public and private and personal and mass modes of transportation.

At the closing ceremony of this collaborative course, each group of students will briefly present (15-20 min per group) its conclusions addressing the following points of view:

1. Give a brief presentation of the topic: definitions and impressions;
2. Comparison between U.S. and Brazil: advantages and disadvantages in terms of available resources, technical difficulties, and legal/institutional challenges;
3. Identify what you consider to be the main points in this subject;
4. How do you view further collaboration in this topic between our institutions?

PARTICIPANT BIOGRAPHIES

(Alphabetical by first name)



Adrian Jones
Harvard College, Class of 2016
S.B. in Electrical Engineering

Adrian Jones is a junior at Harvard College from Harrisburg, Pennsylvania. He is pursuing a Bachelor of Science in Electrical Engineering and is interested in efforts to expand access to electricity in developing countries, renewable energy, and audio electronics. Adrian hopes through the field course to continue to gain a better sense of where he can best apply electrical engineering towards the challenge of building more sustainable societies. In his free time Adrian enjoys playing the piano, beatboxing for his a capella group, and reading.



Alberto Bueno Jr.
Founder & CEO, Profes

Alberto Bueno Jr. is the co-founder and CEO of Profes, the biggest online tutoring marketplace in Brazil, responsible for connecting thousands of tutors and students all over the country. Profes was part of the University of São Paulo's Cietec incubation program and, in 2013, joined the program StartUp Brasil. Before dedicating his time to Profes, Alberto was a Computer Science undergraduate student at the University of São Paulo, and an intern at the Harvard-DRCLAS Brazil Office, where he was responsible for the managing the office's IT projects, such as the web-based database of contacts, and website.



Allan Panossian Kajimoto
CPO & Partner,
Kekanto

Allan Kajimoto is CPO and Partner at Kekanto, where he leads all product-matters and user engagement. He has taken part in co-founding some internet startups in Brazil since 2004. The first was Via6, a business-oriented social network focused in the Brazilian market. Via6 received venture capital from Confrapar and became Brazil's 3rd largest social media in 2008. In 2007 they launched an extension to Via6 called Rec6, a news aggregator platform. After that, Allan and his partners founded Direct Labs, a social media consultant that helps companies to use social media in a strategic way, and Scup, a social media platform for customer relation and brand monitoring. He is a former intern of the Harvard-DRCLAS Brazil Office, where he co-developed a web-based database of contacts. Kajimoto holds a B.A. in Computer Science from the University of São Paulo.



Anastasiya Borys
Harvard College, Class of
S.B. in Computer Science

Anastasiya is a fourth-year student at Harvard College originally from Lviv, Ukraine who now lives in Brooklyn, NY. Anastasiya is studying Computer Science. On campus she is involved with Women in Computer Science, the Institute of Politics and Club Tennis. Outside of the classroom, Anastasiya has a strong interest in quantitative finance and in sustainability, especially with regards to energy. She wants to better understand energy markets, production methods, sustainable technologies, and ideas emerging around sustainability for the future -- especially those leading to potential projects and collaboration. Anastasiya is excited to experience Brazil for the first time and to meet everyone in the program!



André Holzacker Alves
6th-year Undergraduate Student in
Environmental Engineering, Poli-USP

André Holzacker Alves is an Environmental Engineering undergraduate student at the Escola Politécnica da Universidade de São Paulo (Poli-USP). He is interested in topics related to renewable energy technologies and management, and is currently interning at Schneider Electric, where he develops energy efficiency projects for industries and commercial buildings. André has recently finished his graduation project on energy generation using biogas collected from anaerobic reactors at waste water treatment plants, which he believes to be a topic with a huge potential of development in the world. Born in São Paulo, he lived six years in Israel and one year in Switzerland, where he was an exchange student at the Swiss Federal Institute of Technology (ETH) in Zurich. In his spare time, André enjoys traveling, playing basketball, dancing salsa and samba, and playing the guitar.



Avinash Saraf
Harvard College, Class of 2017
A.B. in Social Studies
(secondary in Computer Science)

Avinash Saraf (Avi for short) is a sophomore at Harvard planning to concentrate in Social Studies with a Secondary in Computer Science. He has been fascinated by the intersection of culture and technology and wants to more deeply understand how dramatic advances in technology have impacted social factors like inequality, privacy, and human interactions within society. Avi is particularly excited to better understand how technology's role in making cities sustainable will incorporate cultural and social elements as matters for consideration and potential solutions. On campus, he is involved with Model United Nations, different dance groups, and the South Asian Association.



Bruno Oliveira Musso
6th-year Undergraduate Student in Civil
Engineering and Architecture and
Urbanism, Poli-USP, FAU-USP

Bruno Musso is a sixth-year undergraduate double degree student majoring in Civil Engineering at the Escola Politécnica and studying Architecture and Urbanism at the Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo. It was in this double degree program that he developed interest in urban planning and history of urbanism, which became his favorite subject and potential field

for his professional career. He is also interested in sustainable engineering, and has completed a research on superficial treatment of waste from construction and demolition for reuse in mortar production. Musso spends his free time teaching physics in a college preparatory course, enjoys hanging out with friends, riding his bicycle, and listening to MPB.



Chad Vecitis

Associate Professor of Environmental Engineering,
Harvard School of Engineering and Applied Sciences (SEAS)

Chad D. Vecitis is Assistant Professor of Environmental Engineering at Harvard's School of Engineering and Applied Sciences. Research in the Vecitis Lab focuses on the environmental implications and applications of emerging technology through investigations of the fundamental physical chemical processes behind these technologies. One area of his research interests is environmental nanotechnology with a focus on carbon nanomaterials such as fullerenes and carbon nanotubes (CNTs). Environmental implications of large-scale CNT use on aquatic chemistry and ecosystems will be investigated through examining their antimicrobial mechanism and aquatic photochemistry. Environmental applications of CNTs as electrochemically-active water treatment membranes for pathogen inactivation, pollutant oxidation, and in situ fouling reduction are also being investigated. Another area of research interest is environmental chemistry occurring at aqueous interfaces with a focus on the air-water interface. Interfacial reaction mechanisms and kinetics are often at variance with homogeneous chemistry due to mass transfer, molecular orientation, and catalytic effects. The air-water interface is important for advanced water treatment processes such as ozonolysis and sonolysis and the reactions of gaseous atmospheric oxidants with aerosols. Prior to joining Harvard, Vecitis was a Yale Institute of Biospheric Sciences Postdoctoral Fellow working with Professor Menachem Elimelech. Professor Vecitis holds a B.S. in Chemistry from Johns Hopkins University and a Ph.D. in Environmental Physical Chemistry from the California Institute of Technology.



Ciro Biderman

President, SPTrans;
Professor, Fundação Getúlio Vargas

Ciro Biderman is a Professor of Public Administration and Economics at Fundação Getúlio Vargas (FGV) and an Affiliated Researcher in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology (MIT). Biderman is the current CEO of SPTrans, the city company that manages buses in the public transport system of São Paulo. His research interests include urban and regional economics focused on public policies at the sub-national level, with particular emphasis on transportation economics and land policies. He received his Ph.D. in Economics from the Fundação Getúlio Vargas and completed his post-doctoral studies in Urban Economics at the MIT.



Claudia Visoni

Founder, Conectar Comunicação

Claudia Visoni is a journalist, urban farmer, and member of the Advisory Board for the Environment, Sustainable Development and Peace Cultura of the Pinheiros District. She also works as volunteer in the community gardens of Corujas (Vila Madalena) and Ciclista (in Avenida Paulista).



Claudio Sasaki

Founder, Geekie

Claudio Sasaki is the founder of Geekie, a start-up focused on adaptive learning that personalizes teaching through technology so that all students may develop their full potential. He was the CFO of Petra Energia and has almost 10 years of experience in investment banking, having held the position of Vice-President at Goldman Sachs and Credit Suisse, in addition to other financial institutions. Sasaki received his MBA and Master's in Education from Stanford and his Bachelor's degree in Architecture and Urbanism from the University of São Paulo.



Danilo Amaral Caçado

3rd-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Danilo is a third-year undergraduate student in Environmental Engineering. Since his freshman year he is part of the Poli Junior, a student-run organization that develops engineering projects at low cost for the community. At Poli Junior, Danilo had the opportunity to develop projects and to organize an entrepreneurship competition and a job fair, experiencing the job market reality. He is interested in green constructions, urbanization and other sustainable alternatives that can reduce our impacts on nature and improve quality of life. Through a research project at the Universidade de São Paulo, Danilo had the chance to connect with a social business interested in transforming São Paulo's city center landscape with the installation of vertical gardens. After that, he participated in a vertical garden workshop provided by this organization and was amazed to find out how simple it is to build one and how positively they impact its surroundings. In his spare time, Danilo enjoys travelling, watching movies/TV shows and going out with friends.



Debbie Onuoha

Harvard College, Class of 2015
A.B. in History and Literature, and
Anthropology

Debbie was born in Lagos, Nigeria and grew up in Accra, Ghana. She is currently a fourth-year undergraduate at Harvard, joint-concentrating in History and Literature, and Anthropology. Her academic interests center on the connections between nature and urbanism. For this reason, she has spent the past two years working on an undergraduate thesis and a nonfiction film project, both about a slum community along a major lagoon in the center of Accra. This course will enable her explore how these issues play out in a different part of the world, as well as culminate a class on "Latin American Cities" taken this past semester. Debbie is passionate about African issues and has served as the Vice-President, and Co-Director of the Harvard African Students Association (HASA) and the Pan-African Dance and Music Ensemble (Padame) respectively. In her free time, she enjoys blogging, collecting books, and listening to music, and is also student leader with FOCUS – the Fellowship of Catholic University Students, at Harvard.



Débora dos Santos Carvalho

6th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Débora Carvalho is an Environmental Engineering student at the Universidade de São Paulo (USP). She was born in Porto Alegre and earned a degree in Course of Technology in Industrial Automation at the State University of Rio Grande do Sul prior to joining USP. She is chemical technician with experience in water treatment. She was awarded with a scholarship for academic merit by the Science without Borders Program, through which she concluded her Master's in Engineering Geology and Hydrogeology at the Technical University of Mountain Academy Freiberg, in Germany. While in Germany, Débora created two student groups: one to help her colleagues learn technical Portuguese, and another to discuss sustainable development with international students coming from BRICS countries. She also gave speeches in the Ministry of Foreign Affairs of Germany and in the Embassy of Brazil in Berlin about studying abroad during her time in Europe. Due to her A-class performance in Germany, she was selected among over 80,000 Science without Borders participants to give a speech for the President of Brazil, Dilma Rousseff, in Brasília. Débora intends to develop an international career focused in finding solutions for the use of conflict resources especially in big cities of Brazilian. Besides German, she speaks Italian, French and English, is a passionate about the Afro-Brazilian culture and music, and is conducting independent research on racism in Brazil and extraction of minerals in Africa.



Deng-Tung Wang

Harvard College, Class of 2017
S.B. in Environmental Policy and
Environmental Engineering

Deng-Tung Wang is a sophomore at Harvard College, pursuing a joint concentration in Environmental Policy and Environmental Engineering. Though his primary interests are sustainable energy technologies as well as atmospheric chemistry, he also values the importance of social factors in the implementation of a feasible environmental solution. However innovative the engineering may be, it will not be implemented if it conflicts with political, economic, and social interests. Therefore, policy is very important in the environmental conversation. At Harvard, he is very involved in the theater and arts community, acting and staffing several shows a semester as well as being involved in music groups on campus.



Eloi Alves Ferracioli

4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Eloi Ferracioli is a fourth-year Environmental Engineering student at Poli-USP. Before Poli-USP, Eloi graduated from high school with a technical degree in Business Management, which gave him an entrepreneurial vision to help solve the current environmental problems. During his sophomore and junior years at Poli-USP, he worked in a research project on municipal wastewater treatment using granular activated sludge, operating and monitoring a pilot system in the University Sanitation Laboratory. During this project he was able to increase his knowledge about sewage treatment plants. It helped him realize his big interest is in Sanitation. In August 2015, Eloi will study abroad in France, where he will join the double-degree program at Agro ParisTech for two years. He believes that discussing about sustainable cities with foreign students is a great way to better understanding their environmental problems in Brazil, and to be inspired to create new pathways to overcome those problems. In his spare time, he likes trekking, playing the piano and gardening with friends.



Jahred Liddie

Harvard College, Class of 2016
S.B. in Environmental Science and
Engineering

Born and raised in Central New Jersey, Jahred is in his third year at Harvard College, where he studies Environmental Science and Engineering as a concentration, and Environmental Science and Public Policy as a secondary. He is most interested in climate change and renewable energy, on both scientific and political levels. A passionate writer, Jahred also dedicates much of his time drafting and editing articles on science and politics for Sense and Sustainability, an online blog with “fresh perspectives on sustainable development,” the Harvard Office for Sustainability’s online blog, and the Harvard Review of Environment and Society. He hopes that this program will provide not only a wonderful learning experience, but some great writing material. This past summer, Jahred served as a research intern at the South Engineering Research Center, assisting with a project on 3-D printing. Outside of academics, he enjoys playing the flute, exercising, and reading.



Jason Dyett

Program Director, Brazil Office
of Harvard University’s David
Rockefeller Center for Latin American
Studies (DRCLAS)

Jason Dyett manages the activities and operations of the Brazil Office of Harvard’s David Rockefeller Center for Latin American Studies (DRCLAS). He first moved to São Paulo in 1996, after two and a half years at the DRCLAS in Cambridge during the Center’s launch. From 1997 to 2002, he established the Brazil office of the Economist Intelligence Unit’s telecommunications research division and went on to gain experience growing technology companies backed by local and international investors. Jason rejoined DRCLAS from the Corporate Executive Board, a Washington, DC-based organization that provides executive education to public and private companies. Since the creation the DRCLAS Brazil Office in 2006, he and the Brazil-based team have worked to develop and strengthen opportunities for Harvard student and faculty engagement with Brazil in close collaboration with the Brazil Studies Program at Harvard University. He has a Master’s of Business Administration (MBA) from the University of Chicago Graduate School of Business (2004) and graduated Phi Beta Kappa with a B.A. in Political Science and Spanish from the University of Vermont (1994).



Jenny Fung

Harvard College, Class of 2016
A.B. in Social Anthropology and
History of Science

Jenny Fung is a junior at Harvard College studying Social Anthropology and History of Science, Technology, and Medicine. She is interested in the nexus between urban planning and public health and wants to learn about ways the environment can help support the health of the city. Jenny is also passionate about social justice issues and will be pursuing a senior thesis on commercial sex work in New York City. A native New Yorker herself, Jenny loves to explore the city on foot and refuels with delicious eats from food trucks. She has lived in Venezuela when she was young and has visited Chile and Peru these past few summers to participate in global health programs. In her free time, Jenny enjoys traveling, running, and watching cooking shows.



Jill Larson
Area Director for Environmental
Sciences and Engineering,
Harvard School of Engineering and
Applied Sciences (SEAS)

Jill has a B.S. in Ceramic Engineering and worked in industry for 10 years, lastly as an engineering manager. She earned a Master's of Liberal Arts (ALM) in Business Management at the Harvard University Extension School. Jill started her career at Harvard in 2001 and joined the SEAS team in 2009. Among other responsibilities as Area Director in Environmental Sciences and Engineering, one of her functions includes working with students on community building activities.



Joanne Ngiem
Harvard College, Class of 2015
S.B. in Environmental Sciences and
Engineering

Joanne Nghiem is a senior at Harvard College pursuing a Bachelor of Science in Environmental Sciences and Engineering. She is currently working on her senior thesis, which is designing and building a bottle that utilizes ultraviolet LEDs in order to purify contaminated water making it safe to drink. Research has consumed her life. She can generally be found in the lab at 1 am killing E. coli. She is interested in water treatment systems, renewable energy, and sustainability. Born and raised in Northern California, she loves camping, trees, white water rafting, composting, and IN-N-OUT. Her dreams are to travel the world and help underdeveloped areas establish basic infrastructure, such as clean water, and to have a lot of big dogs. But not cats, she's allergic to cats. She is interested in the intersection between environmental impact, engineering, policy, and society. Most of all, she is extremely excited to travel to Brazil and meet everyone.



Johnathan Budd
Harvard College, Class of 2015
S.B. in Electrical Engineering and
Computer Science

Johnathan Budd is originally from Temecula, California. Johnathan is a senior at Harvard College, living in Winthrop House and studying Electrical Engineering and Computer Science. He is the founder and current president of the SEAS Racing team. He enjoys working on projects that combine electrical and mechanical engineering to solve problems we face in our everyday lives. In his free time he enjoys running, biking, SCUBA diving, and working on cars.



Joseph Lanzillo
Harvard College, Class of 2016
S.B. in Environmental Engineering

Joseph Lanzillo was born and raised outside Chicago, IL. He is in his third year at Harvard College studying environmental engineering with a secondary concentration in earth and planetary sciences. He is most interested in developing renewable energy infrastructure throughout the world, but is excited for the course because he wants to learn more about other sustainable infrastructure that can help societies become less resource-intensive. He spent the summer of 2014 working for Chicago-based SoCore Energy, which develops rooftop solar installations across the United States, and he loved learning about the renewable energy market and technology through that experience. This past year, he has become

involved with rebuilding Harvard's Global Energy Initiative, a pre-professional group for students interested in all things related to energy. He enjoys spending time outdoors any way he can and loves to run, hike, ski and sail. He plays for the Harvard Men's Club Soccer team, and is excited for a chance to play the beautiful game in Brazil!



José Carlos Mierzwa

Associate Professor of Environmental Engineering and Water Treatment, Escola Politécnica da Universidade de São Paulo

José Carlos Mierzwa is an Associate Professor of Environmental Engineering and Water Treatment at the Escola Politécnica da Universidade de São Paulo (Poli-USP). His area of primary expertise is in Sanitary Engineering, with a focus on Environmental Engineering, particularly in terms of water, waste water treatment, conservation, planning, management and environmental quality, and cleaner production. He has developed a number of research projects on water treatment systems (including direct drinking water treatment by spiral wound ultrafiltration membranes), waste stream management, industrial processes, and water conservation and reuse. In 1997 he participated in the International Extension Program at the University of California, Riverside, and in 1993 spent time at the International Atomic Energy Agency working on management of radioactive waste from nuclear power. Since 2007, he has been a reviewer in the Brazilian Higher Education National Evaluation System. Prof. Mierzwa earned a bachelor's degree (1989) in Chemical Engineering from the Universidade de Mogi das Cruzes and a Master's in Nuclear Technology (1996) as well as a doctorate in Civil Engineering (2002) from the Universidade de São Paulo (USP). In 2011, Prof. Mierzwa was on leave from Poli-USP as a visiting researcher at Harvard's SEAS in Cambridge.



Josué Gomes Alencar

Co-Founder, Olhos da Cidade

Josué Gomes is serial entrepreneur, Brazilian army lieutenant, and economist. Josué co-founded Olhos da Cidade, a public safety network that allows public authorities to leverage the eyes of its citizens and to share with them information, thereby improving the quality of life in cities. All this in pursuit of anticipating the facts, minimizing impacts through more efficient responses.



Karena McKinney

Lecturer and Fellow in Environmental Science and Engineering, Harvard's School of Engineering and Applied Sciences (SEAS)

Karena A. McKinney is Lecturer and Fellow in Environmental Science and Engineering at Harvard's School of Engineering and Applied Sciences. Courses taught at Harvard include Environmental Chemistry and Engineering Problem Solving and Design. Dr. McKinney's research focuses on the atmospheric chemistry of biogenic volatile organic compounds (BVOCs), hydrocarbon-based molecules synthesized and emitted by trees and other plants. These compounds play a key role in determining the chemistry and composition of the lower atmosphere by controlling the cycling of atmospheric oxidants and the production of ozone and secondary organic aerosols (particles). Her research seeks to elucidate the complex interplay between naturally occurring emissions of BVOCs and emissions of anthropogenic pollutants, which can drastically alter the chemical fate and atmospheric impact of these compounds in and around populated areas. A combination of direct field measurements and lab experiments are used

to investigate the mechanisms and processes controlling the emissions and oxidation reactions of BVOCs in the atmosphere. Dr. McKinney graduated from Harvard University with a B.A. in chemistry, received a Ph.D. in Chemistry from the University of California, Irvine, and was a Postdoctoral Scholar with Professor Paul Wennberg at the California Institute of Technology. Prior to joining Harvard, Dr. McKinney was at Amherst College, where she was an Assistant Professor of Chemistry.



Katja Lierhaus

Harvard College, Class of 2016,
S.B. in Environmental Engineering

Katja is a junior at Harvard University studying Environmental Engineering and pursuing a secondary in Earth and Planetary Sciences. She was born in Boston and raised in central Massachusetts where she discovered a deep love for nature. In the environmental field, she's especially interested in food sustainability, alternative energy sources, materials science, architecture, and green construction. She is involved with the Harvard Women's Soccer Club team, volunteers for Special Olympics, and works for a lab at the Harvard-Smithsonian Center for Astrophysics. Outside of school, she enjoys to run, play soccer and basketball, read, watch foreign films, cook, and learn new things.



Kristen Faulkner

Harvard College, Class of 2016,
S.B. in Computer Science

Kristen Faulkner is a Junior at Harvard studying Computer Science. She is very interested in entrepreneurship and innovation, particularly in areas with a strong social impact such as health, education, energy, and transportation. She is excited to learn more about Brazil culture, history, and people, and she hopes that while in Brazil she can work on a project she can continue during the semester back at Harvard.



Layla Nunes Lambiasi

5th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Layla Lambiasi, born and raised in São Paulo, is a fifth-year environmental engineering undergraduate student at Escola Politécnica da Universidade de São Paulo. During the first semester of 2014 she had the opportunity to study abroad in Norway. She is currently working on her undergraduate final thesis, which aims to develop the municipal plan for sanitation of a small Brazilian city, which will comprehend projects of water and sewage treatment and distribution, solid waste management and urban drainage. In the past, Layla got involved in an undergraduate research project that aroused her interest for academic career. She intends to start her Master's dissertation as soon as she receives her bachelors. She also plans to focus her studies in the megacities issues in developing countries. Layla was one of the participants in the fifth edition of this collaborative course, and for her it was a unique opportunity for exchange of ideas and to learn about other cultures. She is looking forward to meeting new people, showing her city to the foreign participants, and learning more about the course theme. In her spare time, she likes hanging out with her friends, travelling and studying feminism.



Leonardo Fiocca
4th-year Undergraduate Student
in Civil Engineering,
Poli-USP

Leonardo Fiocca is currently a fourth-year undergraduate student in Civil Engineering at Poli-USP. He has always lived in São Paulo, but have travelled a lot around the globe, gathering different experiences in America, Europe, Africa and Asia. Having an architect father and an engineer mother, he has always been intrigued with the challenges for development of a city like São Paulo, trying to look at it from different perspectives. Since he was little, he had interest in activities apart from his studies at school or university, such as taking singing lessons and studying musical theory and harmony. He is a good golf player, and used to travel a lot to play championships in Brazil and USA. He also likes other sports such as climbing, running and swimming. In his spare time, he enjoys going out with his friends, reading, watching movies and documentaries, and practicing meditation.



Letícia Queiroz
Director of Support to Entrepreneurs,
Endeavor

Letícia Queiroz is Director of Support to Entrepreneurs at Endeavor Brasil, an organization dedicated to leading the global movement to catalyze long-term economic growth by selecting, mentoring, and accelerating the best high-impact entrepreneurs around the world. Letícia holds a B.A. in Business from the Fundação Getúlio Vargas and a Master's in Strategy and Finance from Maastricht University.



Luis A. Bertoni Strengari
5th-year Undergraduate Student in Civil
Engineering,
Poli-USP

Luis Strengari is a senior student concentrating in Civil Engineering at the Escola Politécnica da Universidade de São Paulo. Although he grew up in the countryside of Brazil, he has a passion for urban centers and its exquisite complexity. Luis is interested in developing new strategies and methods to resolve lack of infrastructure and urban planning in massive metropolis. In 2013, he had the opportunity to live in U.S. and study for two semesters at Rutgers, The State University of New Jersey. There, he focused on understanding American culture, techniques, and needs in order to evaluate how their solutions could benefit Brazil's civil engineering panorama. By the end of his exchange program, he worked during the summer in New York as an Intern at Arup, a multinational firm that is known to put sustainability at the heart of its projects. He was part of the team responsible for the development of resilient infrastructure at 22 subway stations as part of the NYC effort to improve flood resiliency and mitigation of the subway system. He also got involved in green infrastructure and smart cities projects. Thus, Luis believes that an opportunity such as the collaborative field course will provide a unique experience of exchanging ideas and knowledge.



Manoel Carlos Pereira Neto
Program Manager, Brazil Office of
Harvard University's David Rockefeller
Center for Latin American Studies
(DRCLAS)

Manoel Carlos Pereira Neto joined the Brazil Office of Harvard University's David Rockefeller Center for Latin American Studies in 2009. Manoel leads the Brazil Office initiatives on cities and the environment and manages the office's administration, finance, and HR. Prior to joining DRCLAS, Manoel worked as an administrative coordinator for a web commerce company in Curitiba, a city in the south of Brazil. At the age of twelve, Manoel was awarded a Microsoft National Talents award for distinguished leadership in social entrepreneurship for volunteer work that originated in his school's computer lab. He is also a State Department Youth Ambassadors Program alumnus. Manoel earned his B.A. in Business Administration from the Pontifícia Universidade Católica de São Paulo (PUC-SP).



Mara Mourão
Founder, MAMO Filmes

Mara Mourão is a Brazilian film director and screenwriter. Mara directed more than 200 commercials, many of them for renowned companies. Among the short films she directed are "Impressions", shot in New York and "Ameianoite", which won the Special Merit Award at the 11th Tokyo Video Festival. In 2012, Mara directed a feature film about social entrepreneurs around the world called "Who Cares". This film had its debut in Brazilian theaters in April 2012. Mara Mourão holds a B.A. in Visual Communication from Fundação Armando Álvares Penteado and an specialization from New York University.



Mariana de Queiroz Omote
4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Mariana was born and raised at São Paulo. She is a 4th-year undergraduate student in Environmental Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP). She decided to major in engineer to learn more about energy production using renewable sources that have lower environmental impacts. She has recently joined AIESEC, which is the largest student organization in the world, and is focused in promoting social exchange. During her free time, she enjoys watching movies, travelling, and going out with her friends.



Mark Ashby
Harvard College, Class of 2016
S.B. in Mechanical Engineering

Mark Ashby is a junior at Harvard College, concentrating in Mechanical Engineering with a secondary in Government. He is passionate about global development, specifically concerning children and improving their quality of life. The summer after his freshmen year, Mark volunteered for a non-profit organization headquartered in Finland, which focuses on giving aid to street kids living throughout eastern Europe. He worked in Yaroslavl, Russia at a drug and alcohol rehabilitation center, where he was active in

expanding their facilities and interacting with rehabilitants. In an effort to accelerate international development, Mark has become interested in the intersection between engineering and public policy. Aside from his academic interests, Mark is an avid soccer player and the captain of the Harvard varsity men's team.



Maurício Salles

Assistant Professor,
Department of Electric Energy and
Automation Engineering,
Poli-USP

Maurício Salles is Assistant Professor in the area of electrical machines at the Escola Politécnica da Universidade de São Paulo. From 2006 to 2008, he joined the researcher team of the Institute of Electrical Machines at the RWTH Aachen University, in Germany. He has experience with computational modelling and dynamic analysis of wind power in power systems and with Finite Element Method-based analysis of electromagnetic devices. His main interests are distributed generation, power generation, power system dynamics and stability, wind turbines, induction generator and renewable energy. He earned his bachelor's degree in Electrical Engineering from Universidade Presbiteriana Mackenzie. In 2004, he obtained the M.Sc. degree in the area of Wind Farms and Power Systems from the Universidade Estadual de Campinas (UNICAMP), and a doctorate degree at the Universidade de São Paulo, also in the area of Wind Power Generation.



Mayra Espinoza-Martinez

Harvard College, Class of 2016
S.B. in Sociology and
African-American Studies

Mayra is a third-year student at Harvard College originally from Visalia, California. She studies Sociology as a concentration and African-American Studies as a secondary. On campus she is most involved with the Harvard Undergraduate Minority Recruitment Program, PBHA Youth Prison Tutoring, and works a part-time job at the student-run Café Gato Rojo. Outside of the classroom she is interested in the political and legal aspects of urban cities, especially for underdeveloped sectors. Mayra is looking forward to visiting Brazil for the first time and learning more about São Paulo's sustainability efforts.



Miguel Bucalem

Full Professor, Department of
Geotechnical and Structural
Engineering, Escola Politécnica da
Universidade de São Paulo

Miguel Bucalem has a distinguished career in academia and city leadership. Following four years as Secretary for Urban Development in the City of São Paulo Government, he recently returned to the University of São Paulo (USP) to set up its new Center for Cities, called USP Cidades. This multi-disciplinary Center focuses on generating insights for São Paulo and other Brazilian cities, with a focus on international learning and partnerships. Bucalem graduated from the Polytechnic School of the University of São Paulo (Poli-USP) in Civil Engineering in 1984. He earned his Master's in Engineering and began teaching at the USP in 1987. He went on to earn his Ph.D. from the Massachusetts Institute of Technology (MIT) in 1992, prior to becoming a Full Professor at Poli-USP. Bucalem served as Deputy Head of the Department of Geotechnical and Structural Engineering at the USP from 1998 to 2002 and as Department Chair in 2006. He coordinated graduate civil engineering programs through the doctoral degree level from 1994 to 1995. In 2007 and 2008, he served as head of the Urban Planning Advisory Department of the Secretary of Planning of the City of São Paulo. From 2009 to 2012, he

served as Secretary of Urban Development. During this period, he also served (2010- 2012) as President of São Paulo Urbanism, the municipal company dedicated to urbanism and urban development. As Secretary of Urban Development, Bucalem lead more than twenty major projects and strategic initiatives for São Paulo. In his roles both as academic and municipal leader, Professor Bucalem has spoken and presented papers at a large number of international conferences on cities and urban development issues. He has published many books and articles on urban development and civil engineering issues.



Monica F. A. Porto

Full Professor and Chair, Department of Hydraulic and Sanitary Engineering, Escola Politécnica da Universidade de São Paulo

Monica F. A. Porto is a Full Professor and current Chair of the Department of Hydraulic and Sanitary Engineering at the Escola Politécnica of the Universidade de São Paulo (Poli-USP), where she has taught since 1984. She is also President of the Fundação Centro Tecnológico de Hidráulica (FCTH), and previously was president of the Brazilian Association of Water Resources (ABRH). She has been an active member of a number of major water organizations including the Global Water Partnership (GWP), the Stockholm International Water Institute (SIWI), and the International Water Resources Association (IWRA). She is a researcher of the Brazilian National Council for Scientific and Technological Development (CNPq) in urban water quality. Her areas of expertise include water quality and water management of reservoirs and rivers. Courses taught at USP include “Introduction to Environmental Engineering”, “Natural Resource Management,” and “Urban Water Systems”. Prof. Porto earned a bachelor’s degree (1978), a Master’s (1983), and a Ph.D. (1993) in Civil Engineering from the Universidade de São Paulo (USP), and carried out post-doctoral research in 1994 and 1995 at Colorado State University (CSU).



Natália de Ponte Rodriguez

6th-year Undergraduate Student in Civil Engineering, Poli-USP

Natália Angelotti de Ponte Rodrigues was born in São Bernardo do Campo, a city in São Paulo’s metropolitan area. She is a 6th-year undergraduate student in Civil Engineering with a high interest in sanitary engineering and environmental issues. Since high school, she has been concerned about sustainable development and had a clear interest in developing engineering solutions that help preserve the environment, combining them to improve people’s living conditions. To this end, she has worked as a volunteer as the NGO “Teto”, building emergency wooden houses in poor communities. She has attended a double degree program between Poli-USP and École des Ponts ParisTech, France, for three years, returning to Brazil in August 2014. During her free time, Natalia enjoys reading, traveling and spending time with friends and family. She’s also interested in learning more about photography and drawing.



Nicolas Chavez

Harvard College, Class of 2016
S.B. in Computer Science

Nicolas Chavez is a junior at Harvard from New York City, with parents originally from Colombia. He hopes to complete his Computer Science degree and explore economics and visual arts/design while at the College. Apart from his own studies, he is a course assistant in the Math department and works on

web or mobile app projects in his spare time. Nick is interested in the application of algorithmic solutions to sustainability issues, innovative technology, and the economics that plays in as well. Nick hopes to connect with Brazilian students and practice his Portuguese while visiting.



Patrick Ulrich

Assistant Director for Undergraduate Studies in Environmental Sciences and Engineering, Harvard School of Engineering and Applied Sciences

Patrick Ulrich is the Assistant Director for Undergraduate Studies in Environmental Sciences and Engineering at SEAS. He started in this position in June 2012, and prior to that he was a Graduate Student Researcher and Graduate Student Instructor at the University of California, Berkeley. His Ph.D. dissertation research studied the production and cycling of methylmercury in tidal wetlands in San Francisco Bay. As a graduate student, Patrick received two research fellowships, including a National Science Foundation Graduate Research Fellowship and a CALFED/Bay Delta Science Program Predoctoral Fellowship, and was awarded an Outstanding Graduate Student Instructor Award from the university for his work in a course on water chemistry. Patrick received a Ph.D. (2011) and M.S. (2006) in environmental engineering from UC Berkeley and a B.S. (2005) in physics from the Pennsylvania State University.



Paulo Eduardo Artaxo Netto

Professor, Instituto Astronômico e Geofísico da Universidade de São Paulo

In the 1980s, Prof. Artaxo initiated the study of tropical aerosols, emphasizing the importance of biomass burning in Amazonia as a source of climatically important aerosol particles. Since 1995, he has been one of the leaders of the LBA (The Large Scale Biosphere Atmosphere Experiment in Amazonia) Experiment. As one of coordinators of the LBA experiment, he coordinated several large international experiments such as ABLE-2A and 2B, TRACE-A, SCAR-B, SMOCC, CLAIRE 98, CLAIRE2001, EUSTACH, AMAZE, among others. Paulo Artaxo earned his undergraduate degree in Physics from the University of São Paulo (USP) and his Ph.D. in Environmental Physics, also from the USP, in 1985. He conducted post doc work at the University of Antwerp, Belgium, University of Lund, Sweden, NASA Goddard Space Flight Center and at Harvard.



Paulo Nascimento Saldiva

Full Professor, Department of Pathology, Faculdade de Medicina da Universidade de São Paulo

Paulo Saldiva is Professor of Pulmonary Pathology and Chair of the Department of Pathology at the Faculdade de Medicina da Universidade de São Paulo (FMUSP). He is a Member of the Science Advisory Committee of the EPA Center for Ambient Particle Health Effects at the Harvard School of Public Health. Saldiva's research interests include pulmonary pathology and air pollution related diseases. The main objective of Saldiva's work in air pollution and human health at the USP is to demonstrate the evidence that relates air pollution to human health, considering two main types of pollutants: particulate matter and ozone. All the inhabitants of large urban centers inhale particles of pollutants present in the atmosphere. Several groups from different countries have found associations between particulate matter contents and hospital admissions, mainly from events related to respiratory and cardiovascular diseases. Saldiva's group of the FMUSP in São Paulo has been dedicated to this kind of study, accumulating

experience in demonstrating adverse health effects due to environmental exposure to particulate matter. His scientific production includes approximately 250 papers, over 40 of which were completed in the past three years. Professor Saldiva earned his Ph.D. in Pathology and his M.D. from the USP.



Paulo Renato Mesquita Pellegrino

Professor of Landscape Architecture and Planning,
Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo

Paulo Pellegrino is Professor of Landscape Architecture and Planning at the Design Department of the Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo (FAUUSP). Previously, he was the Vice-President of the Graduate Program Council at FAUUSP and a Visiting Scholar at the Harvard Graduate School of Design. Pellegrino earned his B.A. in Architecture and Urbanism from the Pontifícia Universidade Católica de Campinas, and a Master's and a Ph.D. in Architecture and Urbanism from the Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo. His research interests include green infrastructure and landscape urbanism, high-performance infrastructure and multi-functional landscapes for stormwater management, urban ecology, urban forestry and carbon sink, circulation, recreation, health, safety and urban renew. He is the co-founder and principal researcher of the Laboratório Verde, at USP, where experimental projects in these subjects are developed and applied in real settings.



Rafael Ferraz do Amaral

2nd-year Undergraduate Student in
Production Engineering, Poli-USP

Rafael Monteiro de Barros Ferraz do Amaral is a second-year undergraduate student in Production Engineering at the Poli-USP. Since his freshman year, he has been involved in several extracurricular activities such as language courses, teacher's assistant programs and at Poli Junior, a Poli student-run company where he manages engineering projects on industrial layout and production optimization. Once he graduates from Poli-USP, he plans to continue studying, and is considering a MBA program abroad. He would like to pursue a career on production and logistical issues, working to minimize its environmental impacts. In his spare time, Rafael enjoys watching TV, playing soccer, and reading.



Ricardo Moreira Lisboa

4th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Ricardo Lisboa is currently a fourth-year undergraduate student in Environmental Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP). He was born in São Paulo and is very concerned about the environmental issues and their impacts the people's lives. During his junior year at Poli-USP, Ricardo conducted a research in a project at the Department Remote Sensing of Transportation Engineering at Poli-USP. This project aimed to contribute to the development of a spatial data infrastructure for monitoring transportation accidents involving hazardous materials, based on spatial data modelling. Since he cares about the city he lives in, since July 2014 he has been working in an environmental engineering consulting company called Inovatech, which assists construction companies in making their buildings environment-friendly. Accordingly, his job is to help them in getting international certifications and present solutions and ideas for sustainable constructions. In his free time, he enjoys practicing sports, reading good books and going out with friends.



Ricardo Young
City Councilor, São Paulo

Ricardo Young Silva is a Brazilian politician and businessman. He was elected City Councilor in São Paulo in 2012 as part of the Popular Socialist Party (PPS). He is one of Brazil's most important voices for sustainability and social justice. Young believes that politics can be redeemed and reframed as a legitimate instrument of social transformation to serve citizens. He is a proponent of better governance and management of cities based on delivery of quality and efficient public services with ethics and transparency. He seeks to help create a more humane, generous, warm and sustainable city. In his youth, he participated in the student movement against dictatorship and for democratic freedoms. Ricardo plays guitar and practices yoga.



Roberto Oranje
Engineering Coordinator,
Banco Santander

Roberto Oranje is an architect with over 25 years of experience in managing corporate design and construction projects for national and multinational companies in Brazil and abroad. His work focuses on sustainability issues in the design, construction and operation of buildings. Roberto is the project manager of the first LEED certified green building in Brazil.



Roberto Zilles
Associate Professor, Department of
Electrical Engineering, IEE-USP

Roberto Zilles is Associate Professor in the Department of Electrical Engineering at the Institute for Energy and Environment at the Universidade de São Paulo. He is also a Editorial Board Member for Progress in Photovoltaic: Research and Applications Magazine. He has experience in electrical engineering, with emphasis on photovoltaic systems, rural electrification, solar home systems, photovoltaic pumping systems, distributed generation and photovoltaic grid-connected systems. Zilles earned his bachelor degree in Physics from the Universidade Federal do Rio Grande do Norte, Master's in Mechanical Engineering from the Universidade Federal do Rio Grande do Sul, Ph.D. in Engineering and Telecommunications from the Universidad Politécnica de Madrid, and became Associate Professor at the Universidade de São Paulo in 2006 (Livre Docência).



Rodrigo Kleinert
5th-year Undergraduate Student in
Civil Engineering, Poli-USP

Born and raised among the busy streets São Paulo, Rodrigo Kleinert has always shown interest in the organization, growth and development of urban infrastructure networks, and how society's success and profit is significantly dependent on them. In 2010, it came as a natural decision to start his undergraduate course in Civil Engineering at Escola Politécnica da Universidade de São Paulo, and in 2012 he embraced the opportunity to broaden his education in Australia at the University of Melbourne for a year. There he focused his studies in urban planning history and transport systems, as well as renewed his perspective of

urban centers while experiencing the multicultural essence of Melbourne, one of the world's most livable cities. The insights triggered him to wonder what were the improvements on infrastructure systems his hometown required and, as he returned home, he decided to focus his studies on urban mobility and sustainability, joining the influence he had abroad to his country's particular needs. Therefore, he has decided to take part in the collaborative course and thinks it is a unique experience to steepen his learning curve and share ideas with people from different backgrounds and points of view.



Thomaz Srougi
Founder, Dr.Consulta

Thomaz Srougi founded Dr.Consulta in 2011 and has run the company ever since. Dr.Consulta is a healthcare venture that has grown 37% per month since inception, attending to low-income uninsured families in Sao Paulo, Brazil. Previously, he was a founding partner at Galicia Investimentos, an investment company founded by former Ambev/AB-Inbev senior executive partners. Prior to that, he launched a search fund that acquired and IPOed a real estate company, and occupied senior management positions at Ambev and Gafisa, and was a Kauffman Fellow. Thomaz holds a B.A. in Business, a MBA and a MPP from the University of Chicago, and a GMP from Harvard Business School.



Vinicius B. Pietrantonio
4th-year Undergraduate Student in Civil
Engineering,
Poli-USP

Vinicius Pietrantonio is a 23-years-old Brazilian from São Paulo. In 2012, he participated in a one-year study abroad program at the University of Bristol - UK, where he participated in an undergraduate research project about concrete performance under high temperature and alternative materials for specific uses. After its conclusion, he completed a four-months internship at Inovatec, a consulting firm with expertise in buildings cladding systems, where he took part as co-author in a manual related to cladding and insulation technologies for steel structure buildings, published by the Brazilian Center of Steel Construction. He is an undergraduate student majoring in Civil Engineering at the Escola Politécnica da Universidade de São Paulo (Poli-USP), and since January 2014 he works as an intern at Logit, a transportation engineering consultancy firm. He is interested in urban planning concerning the interaction between transportation systems and urban activities, their performance and hence in design techniques for those systems, having the urbanization welfare as main goal.



Yolanda de Almeida Santos
5th-year Undergraduate Student in
Environmental Engineering,
Poli-USP

Yolanda Calderaro de Almeida Santos is a fifth-year undergraduate student of Environmental Engineering at the Escola Politécnica da Universidade de São Paulo. She always had a huge interest in environmental issues and innovative ways to change it. She believes that sustainability is the key for a better development of cities. Yolanda lived in France for a year, where she specialized in environmental management and industrial process at Grenoble INP and interned at MCSA SIPEM, a company acting in the aeronautic industry. Prior to that, she took a summer course focused in Finance and Accounting in the United States. Yolanda is not afraid of new challenges, and she always looking for new experiences. Outside the classroom, her passions are traveling, reading, listening to music and cooking.

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