Training the Whole Engineer
Grand Challenges and Development Goals

UN Millennium summit established **8** MDGs, target: 2015

UN Forum on Sustainable Development established, which drafted 2030 Agenda

**17** UN SDGs approved, target: 2030

2000

2008

NAE established **14** Grand Challenges

2010

GCSP launched

2015

**8** Millennium Development Goals (MDGs)

**14** NAE Grand Challenges (GS)

**17** Sustainable Development Goals (SDGs)
Connecting NAE Challenges and UN Goals

NAE GCs
Joy of Living
Security
Health
Sustainability

UN SDGs
Personal and emotional well-being
Global security and equality
Health
Sustainability
Trends of USC GCS Program

- First USC class (2012) had 2 Scholars
- 2018 Class had 44 Scholars

Students are introduced to NAE Grand Challenges during Engineering Academy (Freshman Seminar)
USC Scholars Program

Students must demonstrate **breadth** and **depth** in their education.

- **Research/Creativity**
- **Entrepreneurship**
- **Multidisciplinary**
- **Social Consciousness**
- **Cultural awareness**
Engineering Creativity: RPL

Rocket Propulsion Lab

• Student rocket design club

• In May 2019, they broke the Kármán line (340,000 feet) and reached space. This is a record for an all-student team.
Entrepreneurship: Maker space/start-ups

Entrepreneurship support

- Students have free access to undergrad fab-lab and (new) Baum Makerspace to explore ideas.

- Through the Viterbi Start-Up Garage or Maseeh Prize Competition, they can receive mentoring (and money!) to transition their ideas into a business.
Multidisciplinary: Innovative Degrees

CS-Games degree program

- Joint degree program between Cinema school and Engineering school

- Students take classes in both schools and design a new game as a senior project.

CS students trained alongside design students

SCA Motion capture stage
Cultural Awareness: Global Classrooms

iPodia Classroom

- Students can take degree-required classes through the iPodia networked classrooms
- Course includes end-of-semester, in-person meet-up

As of 2019, the iPodia Alliance is 16 universities

Not shown:
- Tsinghua University in Beijing, China
- The University of Patras, in Patras, Greece
- University of New South Wales, Sydney, Australia
- Shanghai Jiaotong University, Shanghai, China
Specialized courses

- CE 499: Innovation in Engineering Design for Global Challenges
- Students come from all degree programs
- Course includes:
  - Visit to location to meet with all stakeholders
  - Design, prototype of “innovation”
- Supported by Min Family Challenge
Info about USC’s program:
Website: http://viterbiundergrad.usc.edu/gcsp/

These slides:
Website: https://armani.usc.edu/

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