

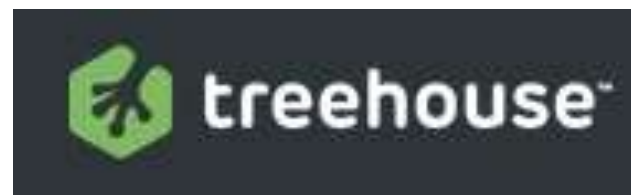


► **Education unites us all.**

- ▶ EDUCATION IS CHANGING
- ▶ STUDENTS ARE CHANGING
- ▶ MEDIA RESOURCES ARE CHANGING
- ▶ CLASSES ARE THE SAME.

► For many the answer is:

ONLINE EDUCATION





QUICK / DIRECT ACCESS	YES	NO	NO	NO
UNIVERSIT Y COURSE ORIENTED	NO	YES	NO	NO
100% FREE	YES	YES	NO	YES
STUDENT CONTENTS	NO	NO	NO	NO
Available Language	English	English	English	English



**Available
Language**

English

English

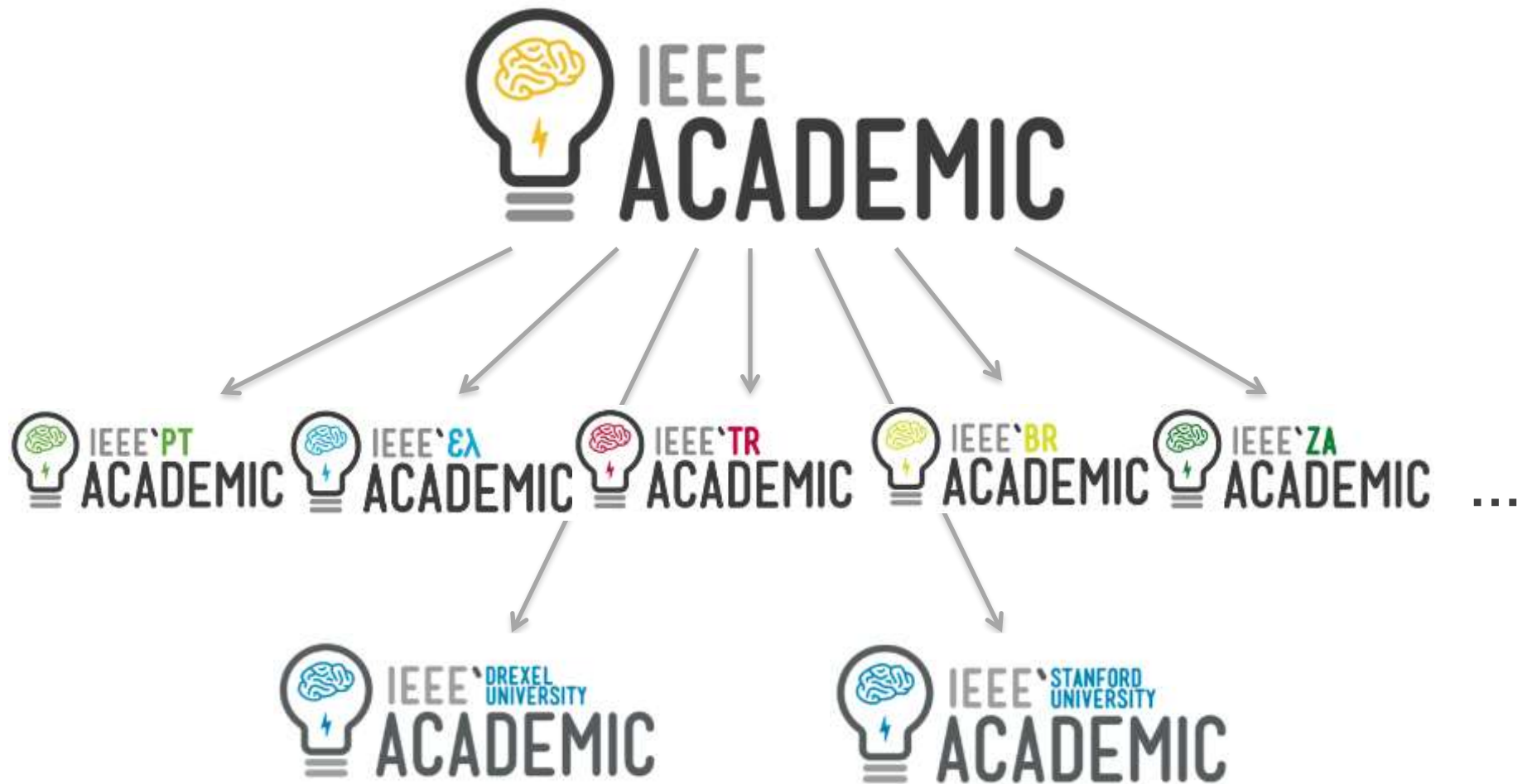
English

English



- ▶ Create a student-driven and locally-based online educational resource developed in cooperation with teachers and universities
- ▶ Most available online-educational resources don't help our students
 - The material is not the same as the material covered in their classes and exams
 - For many students the instruction language of available public sources is not the language in which they are instructed

- ▶ **IEEE student branches served historically as owners of archives of study materials for members**
 - Class notes, past exams and quizzes
- ▶ **The 2013 equivalent of the old class notes in a video presentation summarizing the key concepts from an actual class**
 - With examples
 - Created in cooperation with the class instructor



- **Launched in May 2012**
- **<http://academic.ieee-ist.org>**
- **186 videos January 2013**
 - Linear Algebra
 - Digital Systems
 - Computer Science Theory
 - Differential Calculus
 - Complex Analysis and Differential Equations
 - Introduction to Programming Fundamentals
 - Computer and Electronics Architectures
 - Computational Mathematics
 - Introduction to C programming Language
 - Statistics and Probabilities
 - Object-Oriented Programming Languages
 - Chemistry

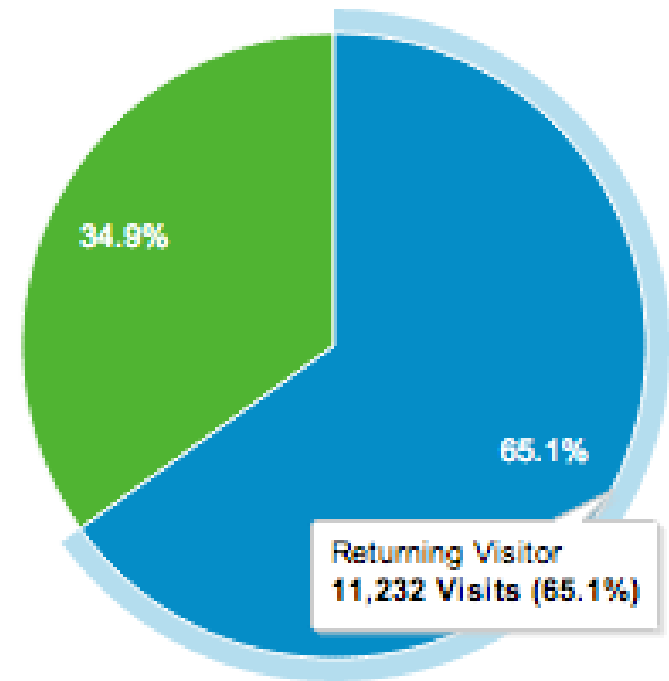


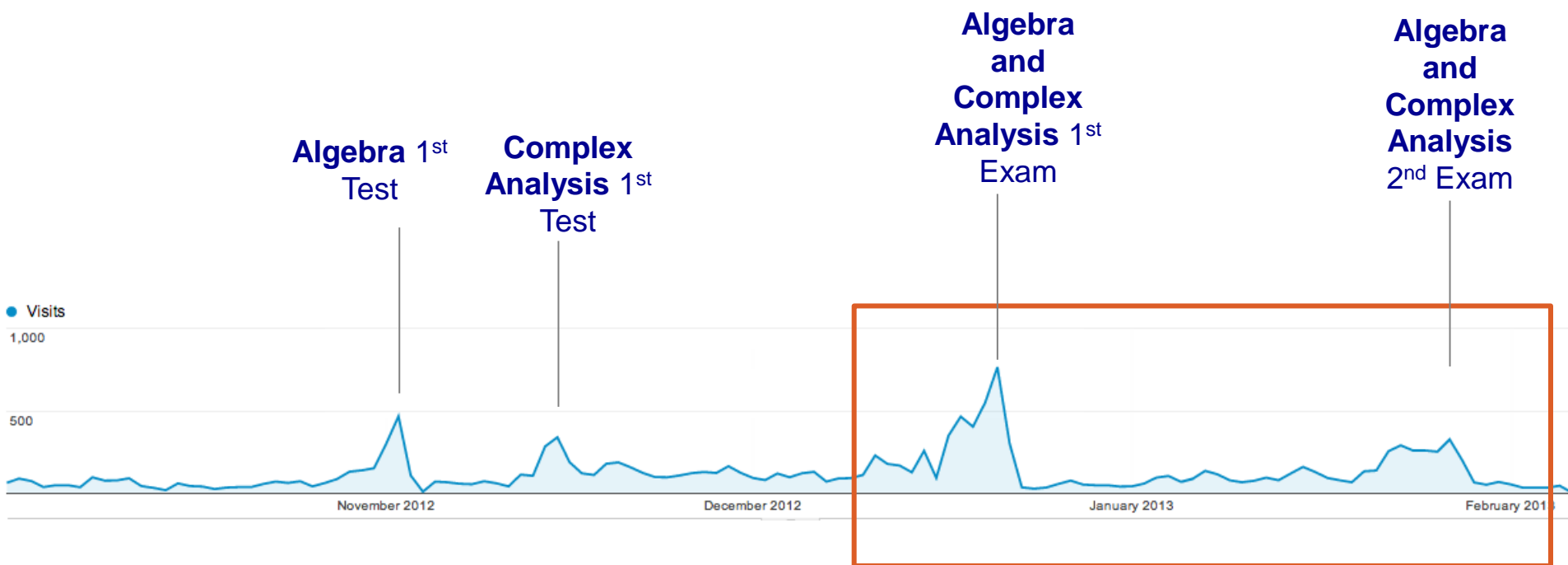
INSTITUTO
SUPERIOR
TÉCNICO

Sampling date: September 2012 – January 2013

- 18 000 visitors
- 48 000 video views
- 150 000 minutes watched

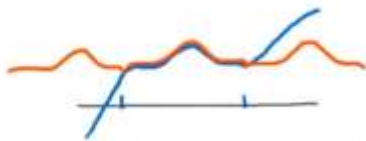
■ Returning Visitor ■ New Visitor





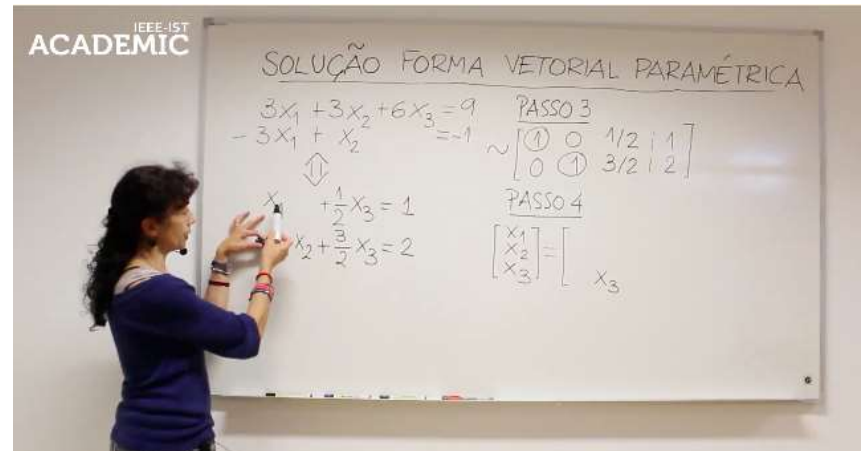
Exams Period



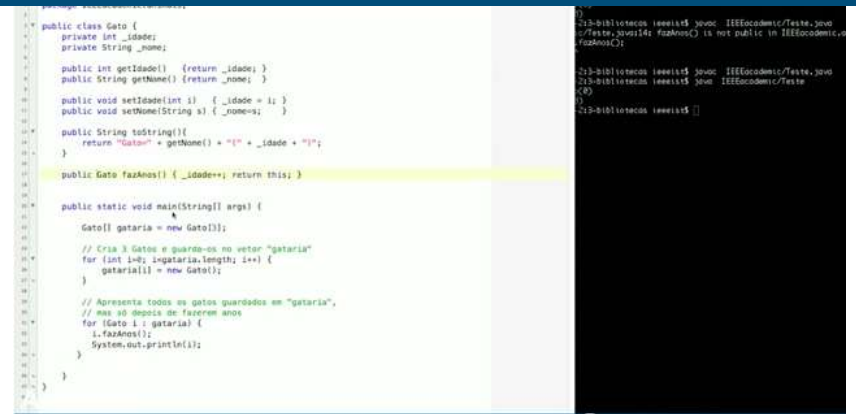
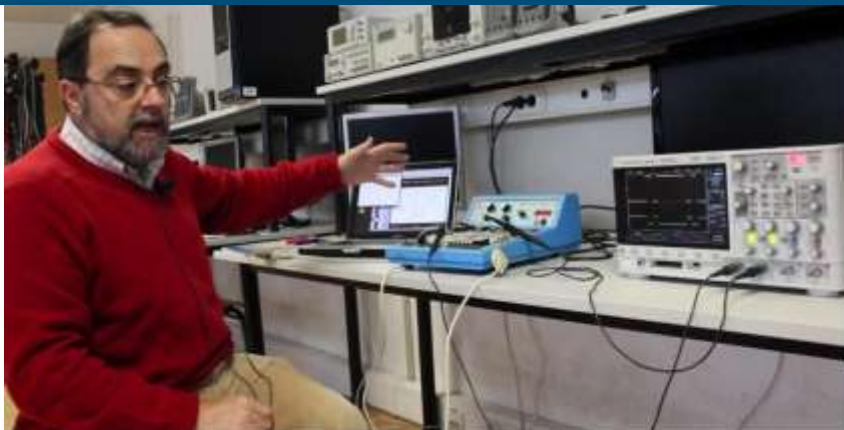


$$f(-x) = a_0 + \sum a_n \cos\left(\frac{2\pi n x}{\dots}\right) - \sum b_n \sin\left(\frac{2\pi n x}{\dots}\right)$$

$$f(x) = a_0 + \sum a_n \cos\left(\frac{2\pi n x}{\dots}\right) + \sum b_n \sin\left(\frac{2\pi n x}{\dots}\right)$$



Short modules of 7 minutes about a specific topic





NAVIGATION BAR

SOME CATCHY PHRASE TO PUT HERE TO HERE THAT CAN
PRESENT THE PROJECT IN A FEW WORDS AND ALSO
CONVINCED PEOPLE TO SEARCH CONTENTS
X UNIVERSITIES | X LANGUAGES | X VIDEOS

SEARCH CONTENTS:

SEARCH TERM <TOPIC TITLE/COURSE NAME/TEACHER NAME/KEYWORDS>

**HIGHLIGHT
CONTENT #1**

**HIGHLIGHT
CONTENT #2**

COMPUTER SCIENCE > COMPUTERS AND DEVICES ARCHITECTURES



SERIAL COMMUNICATION ARCHITECTURES

RS-232 ARCHITECTURE - INTRODUCTION**AUTHOR:** Prof. Rui Rocha**UNIVERSITY:** Instituto Superior Técnico**LANGUAGE:** Portuguese**DATE:** 24 February 2013**KEYWORDS:**serial communication, computer hardware,
serial ports, computer architecture

In telecommunication and computer science, serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels. Serial communication is used for all long-haul communication and most computer networks, where the cost of cable and synchronization difficulties make parallel communication impractical. Serial computer buses are becoming more common even at shorter distances, as improved signal integrity and transmission speeds in newer serial technologies have begun to outweigh the parallel bus's advantage of simplicity (no need for serializer and deserializer, or SerDes) and to outstrip its disadvantages (clock skew, interconnect density).

VIDEO SEQUENCE OF: SERIAL COMMUNICATION ARCHITECTURES

**ASSYNCHRONOUS SERIAL
COMMUNICATION****RS-232 ARCHITECTURE - INTRODUCTION****RS-232 - STANDARD SERIAL PORTS**



QUICK / DIRECT ACCESS	YES	NO	NO	NO	YES
UNIVERSITY COURSE ORIENTED	NO	YES	NO	NO	YES
100% FREE	YES	YES	NO	YES	YES
STUDENT CONTENTS	NO	NO	NO	NO	YES
Available Language	English	English	English	English	Several



**Available
Language**

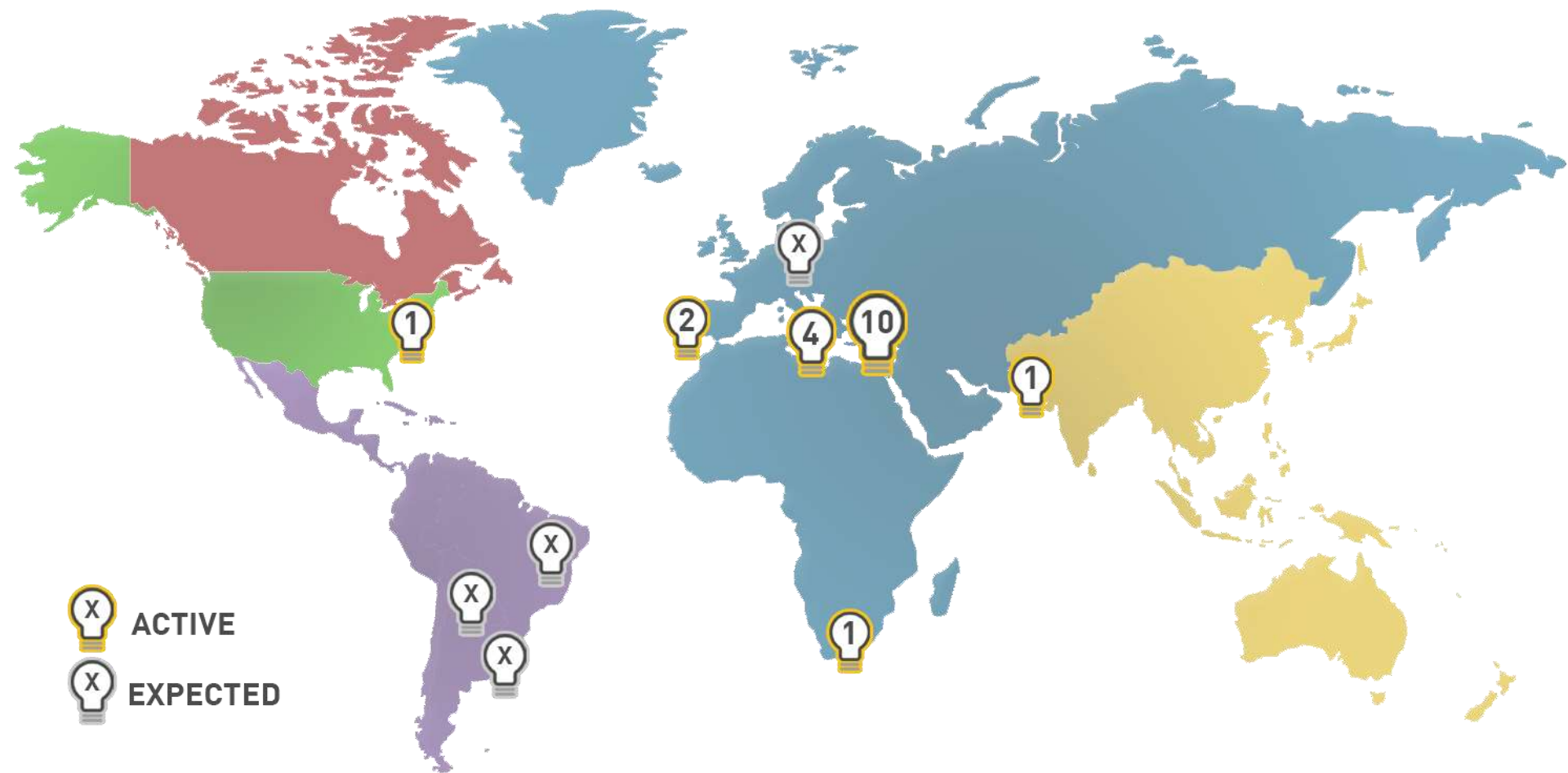
English

English

English

English

Several



 **ACTIVE**
 **EXPECTED**

- **Single-time Investment \sim 1000\$**
- **Maintained by students**
- **Support from University and relevant partnerships**
- **Long-running project (at least 4 years)**

- **First steps towards improving education methodologies**
- **Reversed Classrooms**

The Flipped Classroom

Turning homework and class time upside down



Traditional Way

☀ Day: Teacher delivers lecture to class

🌙 Night: Students complete homework exercises

Khan's Way

🌙 Night: Students receive instruction from videos

☀ Day: Students do exercises while teacher helps those who are struggling

- ▶ **IEEE Students will have access to the first worldwide multi-language online educational resource in Engineering and Computing**
- ▶ **IEEE will have an active educational initiative with wide impact**
 - Making a mark in education innovation

- ▶ **Students from several different regions and sections will collaborate to create and maintain a joint project**
- ▶ **The contents created today will last for several years, maintained by IEEE student volunteers**
 - Maintenance will be inexpensive and locally motivated

- **NIC approved project for the first year**
- **We are seeking for expansion through sections**
- **World impact project starting in Region 8**
- **We can change worldwide education, starting today.**

