Numbers and Numeracy Practices

Instructor: Associate Professor Marc Böhlen (marcbohlen@acm.org)
Course TA: MFA-March Candidate Nima Vakili (nima.vkl@gmail.com)
Registration #17243 (lecture) and #22938 (lab)
Workshop/Seminar: Mon 15:00-16:50, CFA 246; Lab: Wed 15:00–16:50, CFA246; Office hours: M/W: 17:00-18:00

Course description:

The internet is producing data on unprecedented scales while data mining and data visualization methods struggle to manage the increasing data deluge. But what do all the numbers really mean?

This seminar + lab will cover fundamental concepts of numbering systems and dive into the culture of numerical practices. The course will investigate data, numeric representations, numbering systems and numeric protocols in order to better understand how our relationship to numbers and numbering practices is generated and how it is changing in the wake of Big Data. The seminar will include an overview of significant milestones in the development of numbering practices. We will understand numerical procedures as cultural forces, and seek to understand in particular how such new numeric opportunities might enable new media arts practices.

The seminar includes a compulsory lab section with tutorials and programming exercises that will allow students to experiment with numbering systems, numerical procedures and data visualization. A semester project employing the course materials towards an intriguing media art work or investigation is required by all participants.

Course materials:

All materials are available on the course website
www.realtechsupport.org/RESEARCH!/courses/numberingpractices.html

Requirements:
Graduate standing or instructor permission.

Deliverables:
a) active participation in class discussions and readings.
b) completion of programming exercises.
c) a seminar project that in some interesting way makes use of the materials presented in class. Details TBA.

Grading:
a): 20%, b): 20%, c): 60%

Learning objectives:
- grasp of fundamental ideas underlying numerical systems (a)
- understanding of the intersections between cultural activity and numerical systems (a)
- ability to perform basic numerical operations in computer code (b)
- ability to read and appreciate advanced texts in computing culture (a)
- ability to apply quantitative numerical operations in a media arts context (a,b,c)
Course schedule:

W01  
Aug27  syllabus explained, sign up for lab computers

W02  
Sep03  no class
Sep05  course introduction  
(Stevens 1946 – Scales of Measurement)

W03  
Sep10  numbering systems: overview  
(Thrift 2004 – Movement-space)
Sep12  LAB: python tutorial part A

W04  
Sep17  numbering systems: basic concepts  
(Stevens 1946 – Scales of Measurement)  
(Himbert 2009 – A Brief History of Measurement)  
Sep19  LAB: python tutorial part B

W05  
Sep24  numbering systems: history  
(Ifrah 1998 – The Universal History of Numbers)  
(Nickerson 1988 – Counting, Computing, and the Representation of Numbers)  
(Knuth 1977 – Ancient Babylonian Algorithms)  
Sep26  LAB: python tutorial part C exercise 1

W06  
Oct01  numbering systems: statistics and big data  
(Pentland 2006 – Human Computing and Machine Understanding of Human Behavior)  
(Pentland et al 2009 – Computational Social Science)  
Oct03  LAB: processing tutorial part A

W07  
Oct08  numbering systems: statistics and machine learning  
(RTS – statistics tutorial)  
Oct10  LAB: processing tutorial part B

W08  
Oct15  numbering systems: sociology and anthropology  
(Lampland 2010 – False numbers as formalizing practices)  
(Muniesa & Trébuchet-Breitwiller 2010 - Becoming a Measuring Instrument)  
Oct17  LAB: processing tutorial part C exercise 2

W09  
Oct22  numbering systems: sociology and anthropology  
(Neuringer 1981 – Self-Experimentation. A call for change)  
(Guyer 2010 – The Eruption of Tradition? On Ordinality and Calculation)  
Oct24  LAB: statistics

W10  
Oct29  numbering systems: media arts  
(Morley 2004 – Why are innovations in the health field needed?)  
(Tuur van Balen ; Annetta Kapon; RTS)  
Oct31  LAB: internet of things

W11  
Nov05  numbering systems: media arts  
(Sterling 2005 – Shaping Things)  
(Fiona Raby – Dunne & Raby)  
Nov07  LAB: internet of things
W12
Nov12       numbering systems and language
            (Krifka 2011 – Approximate Interpretations of Number Words)
Nov14       LAB: exercises

W13
Nov19       numbering systems: select readings
Nov21       LAB: exercises

W14
Nov26       project development
Nov28       project development

W15
Dec03       project development
Dec05       project development

W16
Dec10       final presentations

semester project

DMS Policies:

• Students are entitled to a course syllabus with course content, meeting times, course requirements, grading criteria, statements on academic integrity, disabilities, sexual harassment

• Criteria for grading of projects and papers should be made explicit before the work is due; formats for examinations should be made explicit prior to their administration.

• All students must meet the academic requirements stated in the course syllabus. This includes papers, projects, class participation, and laboratory assignments that count toward the final grade.

• Late work is accepted only at the discretion of the instructor.

• Students who fail to adhere to punctuality or miss classes will see their grade impacted accordingly.

• Incomplete grades can be requested but remain at the discretion of the instructor. If request is approved, faculty member and student must complete and sign the “Departmental Request for Grade of Incomplete” form http://src.buffalo.edu/pdf/RequestforIncompleteGrade.pdf

• Students must adhere to DMS equipment access and usage rules as outlined in the Equipment Room Policy - http://mediastudy.buffalo.edu/equipmentpolicy.php

• Weapons are not allowed on campus. If students are planning a production that involves using anything which could be interpreted as a weapon they must obtain written permission from the University Police or the equivalent authority beforehand.

• No student can be required to view or respond to materials he/she deems offensive. Substitute materials will be made available, where possible.

• Collaboration is encouraged where appropriate and in accordance with the instructor’s consent. However, plagiarism is never acceptable. Students must understand that they may under no circumstances knowingly represent as their own any idea or expression of an idea or work of another in any academic examination or term test, or in connection with any other form of academic work. If in doubt, the student should err on the side of caution and consult the instructor for guidance.

• If a student has a disability (physical or learning) the student may contact the Office of Disability Services http://www.student-affairs.buffalo.edu/ods/ during the first two weeks of class. ODS will provide information on arrangements for reasonable accommodations.

• Sexual harassment of employees and students, as defined at http://undergraduate-catalog.buffalo.edu/policies/conduct/nondiscrimination.shtml, is contrary to university policy.

• Classes are to meet at the time and location listed in the schedule, unless changed with the consent of the entire class, and approved by the Department Chair.

• Instructors are to be available for consultation during office hours and, at the discretion of the instructor, by appointment.

• Instructors are required to justify a grade, if a student asks for this information. Instructors should retain academic records for one year after the end of the course.