Revision

Kim O’Shea
kim.oshea@ul.ie
Week 1

Digital Media:

- Digital media is usually defined as electronic media that work on digital codes. Today, computing is primarily based on the binary numeral system. (In this case digital refers to the discrete states of "0" and "1" for representing arbitrary data.)

- Computers are machines that (usually) interpret binary digital data as information and thus represent the predominating class of digital information processing machines.

- Digital media (like digital audio, digital video and other digital "content") can be created, referred to and distributed via digital information processing machines.
Week 1

Timeline overview - brief history of the Internet

- Gottfried Wilhelm von Leibniz
- Charles Babbage
- George Boole
- Herman Hollerith
- Paul Otlet
- Alan M Turing
- John von Neumann
- Vannevar Bush
- J.C.R. Licklider
- Robert Taylor
- Douglas Engelbart
- Ted Nelson
- Alan Kay
- Tim Berners-Lee
George Boole:
- Mathematician, logician and philosopher; first professor of maths at Queen’s College Cork (now UCC)
- Invented Boolean algebra, the basis of all modern computer arithmetic - no practical application at the time of invention!
- Boole is regarded in hindsight as one of the founders of the field of computer science, although computers did not exist in his day.
Week 1

Alan Turing:
- Mathematician, computer scientist, logician, cryptanalyst, philosopher and theoretical biologist
- Considered to be the father of modern computer science
- Developed an electromechanical machine (the bombe) that could find settings for the Enigma Machine: *The Imitation Game*
- Involved in the design of Manchester Mark 1, one of the first computers ever built
Week 1

Vannevar Bush:
- American engineer and science administrator, known for his political role in the development of the atomic bomb, and the idea of the memex—seen as a pioneering concept for the World Wide Web.

- He introduced the concept of what he called the memex in the 1930s, a microfilm-based device in which “an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility.”
Week 1

Doug Engelbart:
- American inventor of Norwegian descent;
- Pioneer of human-computer interaction (HCI), whose team developed:
  > multiple overlapping windows,
  > the original mouse,
  > the screen cursor,
  > video conferencing,
  > hyperlinks,
  > cut-and-paste.
- A committed and vocal proponent of the development and use of computers and networks to help cope with the world's increasingly more urgent and complex problems.
Week 2

Communication Technology:

- First, there is a need (to communicate)
- The medium is conceptualised
- The technology is developed
- The technology is implemented

Rinse & Repeat…
Week 2

- Written Communication → Mists of Time
- Postal Service → 550 BC
- The Printing Press → 1041 (Guttenberg 1450)
- The Telegraph → 1830s (1858 transatlantic cable)
- The Telephone → 1860s
- The Radio → 1900s
- Television → 1940s
- The Internet → 1990s
Week 2 (Internet Timeline)

- **1958**: DARPA began as the Advanced Research Projects Agency (ARPA) in 1958 by President Dwight D. Eisenhower for the purpose of forming and executing research and development projects to expand the frontiers of technology and science and able to reach far beyond immediate military requirements


- **1965**: Dial-up Wide-Area Network (WAN)
Week 2 (Internet Timeline)

- 1966: ARPANET
- 1968: Packet Switching implemented
- 1971: Email
- 1973: File Transfer Protocol
- 1978: TCP/IP implemented
- 1985: IEEE 802.11 (Wi-Fi)
- 1993: Peer-to-Peer Networking
Week 3

Society and Technology:

"We make our tools, and our tools shape us." (Marshall McLuhan)

Is the society determining the type of research that is funded and what kind of tools we build?

OR

Is the technology determining how society evolves?
Copyright: is a form of intellectual property that gives the author of an original work exclusive rights for a certain time period in relation to that work, including its publication, distribution and adaptation, after which time the work is said to enter the public domain.
Week 3

Intellectual Property Rights

Copyleft: is a play on the word copyright to describe the practice of using copyright law to remove restrictions on distributing copies and modified versions of a work for others and requiring that the same freedoms be preserved in modified versions.
Creative Commons (CC) is a non-profit organization headquartered in California, devoted to expanding the range of creative works available for others to build upon legally and to share.

The organization has released several copyright-licenses known as Creative Commons licenses for free to the public. These licenses allow creators to communicate which rights they reserve, and which rights they waive for the benefit of recipients or other creators.
Week 3

Creative Commons licenses:

• Attribution (CC-BY)
• Attribution Share Alike (CC-BY-SA)
• Attribution No Derivatives (CC-BY-ND)
• Attribution Non-Commercial (CC-BY-NC)
• Attribution Non-Commercial Share Alike (CC-BY-NC-SA)
• Attribution Non-Commercial No Derivatives (CC-BY-NC-ND)
Week 4

Open Culture:

...a concept according to which knowledge should be spread freely and its growth should come from developing, altering or enriching already existing works on the basis of sharing and collaboration, without being restricted by rules linked to the legal protection of intellectual property.
Week 4

Free Software Movement:

A social movement with the goal of obtaining and guaranteeing certain freedoms for software users:
> the freedom to run the software,
> to study and change the software, and
> to redistribute copies with or without changes

- Started in 1983 by Richard Stallman, with the GNU project
Week 4

Open Source Software:
Software developed jointly by volunteers, that can be used, reused, altered and used for commercial purposes.

Free or Open?
The two terms describe almost the same category of software, but they stand for views based on fundamentally different values. Open source is a development methodology; free software is a social movement.
Week 4

Makerspaces, Hackerspaces, FabLabs: The DIY Culture

FabLabs are run by an organisation of some sorts (university, research centre, innovation centre)

Hackerspaces are community led physical spaces where people can meet and work on their projects

The terms “Hackerspace” and “Makerspace” are often used interchangeably
Week 5

Marshall McLuhan:

3 basic technological innovations:
- (1) the invention of the phonetic alphabet by the humans out of oral patterns of speech and thought, for the dominance of literate forms of communication
- (2) the introduction of movable type by Gutenberg in the 11th Century accelerated this process
- (3) the invention of electric media, beginning with the telegraph and followed in succession by radio, films, telephone and the Internet
Week 5

Marshall McLuhan and “The Medium is The Message”

McLuhan understood "medium" in a broad sense. He identified the light bulb as a clear demonstration of the concept of “the medium is the message”. A light bulb does not have content in the way that a newspaper has articles or a television has programs, yet it is a medium that has a social effect; that is, a light bulb enables people to create spaces during night-time that would otherwise be enveloped by darkness. He describes the light bulb as a medium without any content. McLuhan states that "a light bulb creates an environment by its mere presence."
Week 5

The Medium is the Message:

"The medium is the message. This is merely to say that the personal and social consequences of any medium - that is, of any extension of ourselves - result from the new scale that is introduced into our affairs by each extension of ourselves, or by any new technology."
Week 5

Extensions (of Man)

Thus, the wheel extends our feet; the phone extends our voice; television extends our eyes and ears; the computer extends our brain, and; electronic media, in general, extend our central nervous system.
Extensions (of Man)

[For a driver] “attention is fixed on the figure rather than the ground, on the wheel rather than the huge system of road services necessary to maintain the existence of a wheel or wheeled vehicles. With a motorcar, most people are interested in changing designs or patterns of the car. They pay only marginal attentions to the huge service environment of roads, oil companies, filling stations, and other allied services of manufacturing that are the ground of the car.

...by not looking at the ground around the automobile you miss the message of the car. For it is the ground [context] of any technology that is the medium that changes everybody, and it is this medium that is the message of the technology, not the figure.”
Week 5

Innovation and Inventors

Thomas Edison: “My principal business consists of giving commercial value to the brilliant, but misdirected, ideas of others…. Accordingly, I never pick up an item without thinking of how I might improve it.”
Week 5

Innovation and Inventors

Wireless Communication:
What prevents mobile phone conversations from criss-crossing, or devices in proximity with the same communication protocols from clashing? This management of transmissions is known as 'Frequency Hopping Spread Spectrum'.

Many modern patents refer to this KieslerAntheil patent document, U.S. patent no. 2,292,387 as the basis of the field of FHSS. (Hedy Kiesler & George Antheil)
Week 5

Innovation and Inventors

Hedy Kiesler (Hedy Lamarr)
Her insight was that you could protect wireless communication from being jammed by continually varying the frequency at which radio signals were transmitted. Even if it was detected, as the channel would be switched unpredictably, the enemy wouldn't know which bands to block. But, to patent you have to show a practical use...
Week 5

Innovation and Inventors

She enlisted the help of friend and musician George Antheil to demonstrate a practical application of her idea. They synchronised 2 pianos on 88 different frequencies.

Despite the issuance of the patent and its endorsement by the National inventors Council (NIC), the Navy did not take it seriously. Years later, Lamarr and Antheil were told the invention was felt to be... “too bulky to fit on the average torpedo.”
Week 6

Social Media

The use of web-based and mobile technologies to turn communication into an interactive dialogue.

Main categories: Social Networking, Blogs, Microblogs, Wikis, Social curation, Social reviews
Week 6

Social Media

Characteristics:
participation - collaboration - social - multiple, mixed media - collective intelligence - web as platform - various ways to consume it

Social impacts of social media:
In what ways has social media changed our social environment? Has social media had a positive or negative impact on our social environment? Do the negative effects of social media outweigh the benefits?
Designing for Societal Problems

Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.

Participatory Design: ...where the people destined to use the system play a crucial role in designing it. The Scandinavian Approach...1970's
Week 7

Designing for Societal Problems

CSCW is a generic term, which combines the understanding of the way people work in groups with the enabling technologies of computer networking, and associated hardware, software, services and techniques.
"Within the Human Factor approach, the human is often reduced to being another system component, with certain characteristics, such as limited attention span, faulty memory, etc. that need to be factored into the design equation for the overall human-machine system... By using the term "human actors" emphasis is placed on the person as an autonomous agent that has the capacity to regulate and coordinate his or her behaviour, rather than simply being a passive element in a human-machine system. This change in terminology may help in adjusting one's perspective..." (Bannon 1991)
Week 7

Designing for Societal Problems

“Interaction design is a new discipline: a fusion of aesthetics and culture, technology and the human sciences. It concerns the design both of the services these technologies might offer, and the quality of our experience of interacting with them.”
Usability is a term used to denote the ease with which people can employ a particular tool or other human-made object in order to achieve a particular goal. Usability can also refer to the methods of measuring usability and the study of the principles behind an object's perceived efficiency or elegance.
Week 7

Designing for Societal Problems

Accessibility is a general term used to describe the degree to which a system is usable by as many people as possible. In other words, it is the degree of ease with which it is possible to reach a certain location from other locations. It is not to be confused with usability which is used to describe how easily an entity (e.g., device, service, environment) can be used by any type of user.
Week 8

New Media Art

New Media art can be seen as a response to the information technology revolution and the digitization of cultural forms.

The introduction of the Web browser catalyzed the birth of New Media art as a movement. New Media artists saw the Internet much as their predecessors saw the portable video camera: as an accessible artistic tool that enabled them to explore the changing relationship between technology and culture.
Week 8
New Media Art themes
Collaboration & Participation
From appropriation to open source
Corporate parody
Hackers and hacktivism
Interventions
Identity
Telepresence and surveillance
Week 8

New Media Art themes

Collaboration & Participation
From appropriation to open source
Corporate parody
Hackers and hacktivism
Interventions
Identity
Telepresence and surveillance
Week 9

State of the Art

The Dynabook (Alan Kay)
"A personal computer for children of all ages", outlines the requirements for a conceptual portable educational device that would offer similar functionality to that now supplied via a laptop computer or (in some of its other incarnations) a tablet or slate computer with the exception of the requirement for any Dynabook device offering near eternal battery life.
Week 9

State of the Art

The Dynabook was never realised, but we do have...

- Wearables
- Smart Homes
- Smart Cities
- Robotics and AI
- Digital Fabrication, smart textiles
- New musical instruments, types of performances...
Wearables

Wearable computing is the study or practice of inventing, designing, building, or using miniature body-borne computational and sensory devices. Wearable computers may be worn under, over, or in clothing, or may also be themselves clothes (i.e. "Smart Clothing" (Mann 1996))
Week 9

Wearables

- Healthcare
- Wellbeing
- Fitness
- Monitoring babies & pets
- Specific workplaces, i.e. firefighting, manufacturing
- Games and Virtual Reality
- Performances and Art

In many applications, user's skin, hands, voice, eyes, arms as well as motion or attention are actively engaged as the physical environment.
Week 9

Wearables

The Quantified Self

Incorporating technology into data acquisition on aspects of a person's daily life in terms of inputs (e.g. food consumed, quality of surrounding air), states (e.g. mood, arousal, blood oxygen levels), and performance (mental and physical)
Week 9

Wearables - where next?

Transhumanism - An intellectual movement that aims to transform the human condition by developing and creating widely available technologies to greatly enhance human intellectual, physical, and psychological capacities
Week 10

Education in the Digital Age

- Learning: The act, process, or experience of gaining knowledge or skill, through schooling or study.
- E-Learning is a general term that is used to refer to computer-enhanced learning.
- The field of Technology Enhanced Learning therefore describes the support of any learning activity through technology.
- Blended Learning is the combination of multiple approaches to learning.
Week 10

Education in the Digital Age

The printing press revolutionised education

And then came the computer…

Computer-Assisted Learning - CAL

Learning Management Systems

Content Management Systems
Week 10

Education in the Digital Age

Portfolios / e-portfolios

An electronic portfolio, also known as an e-portfolio or digital portfolio, is a collection of electronic evidence assembled and managed by a user, usually on the Web. E-portfolios are both demonstrations of the user's abilities and platforms for self-expression, and, if they are online, they can be maintained dynamically over time.
Week 10

Education in the Digital Age

Use social media channels effectively

Create a ‘brand’

Don't join everything

Keep your information up to date
Week 10

Smart Cities, Smart Citizens

A smart city is an urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently.

The Smart Citizen idea reflects that fact that when we talk about smart cities and smart citizens we are talking about more than just optimising the control, use, and efficiency of infrastructures.
Week 11

Collaborative Economy

An economy built on distributed network of connected individuals and communities as opposed to centralised institutions

A system that activates the untapped value of all kinds of assets through models and marketplaces that enable greater efficiency and access
Week 11

Collaborative Economy Values

Collaboration: encouraging collaboration with peers

Empowerment: empowering people to become ‘produsers’

Openness: peers are becoming open to new ways of producing/consuming/learning etc.

Humanness: making human connections instead of connecting to central powers
Collaborative Economy

Platform Cooperativism: Instead of having all the profits go to the creator of the platform, the providers of the services or goods are forming a cooperative and create their own digital platform. A platform co-op is a cooperatively owned, democratically governed business that establishes a computing platform, and uses a protocol, website or mobile app to facilitate the sale of goods and services.
Week 11

Culture / Cultural Heritage

Culture: The sum of attitudes, customs, and beliefs that distinguishes one group of people from another. Culture is transmitted, through language, material objects, ritual, institutions, and art, from one generation to the next.
Week 11

Culture / Cultural Heritage

Cultural Heritage: Cultural heritage is the legacy of physical science artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations.
That’s it!

As you can see, we've covered a lot of material in the lectures.

Your exam consists of 8 questions, you answer 4. You have full access to the internet (including the wiki!) so before you answer, ensure you are relating the question to one of the topics presented in the last 55 slides.

I'm looking at you, Intellectual Property Rights!!