

# 情報基礎B (Computer Literacy)

## Lecture 1: Course Overview

Matias Korman

Tohoku University Graduate School of Information Sciences  
System Information Sciences  
Design and Analysis of Information Systems

# About me

- Matias Korman
  - Assistant Professor, Graduate School of Information Sciences
  - <http://www.dais.is.tohoku.ac.jp/~mati/>
    - Bonus! Find these slides there!
  - [mati@dais.is.tohoku.ac.jp](mailto:mati@dais.is.tohoku.ac.jp)
  - Course taught in English
  - Also speak in Catalan, Spanish, French, Italian, Japanese
- Profile
  - First time to Japan in 2003
  - Studied in Tohoku University (06-09)
  - In 2015 returned to Sendai
  - Research in theoretical computer science

# Teaching Assistants

- Quentin Labernia
  - English
  - French
  - Some German
  - [quentin@dais.is.tohoku.ac.jp](mailto:quentin@dais.is.tohoku.ac.jp)
- Aji Kasmaji
  - English
  - Indonesian
  - [ajiajiasmaji@gmail.com](mailto:ajiajiasmaji@gmail.com)

Slides by Jinhee Chun

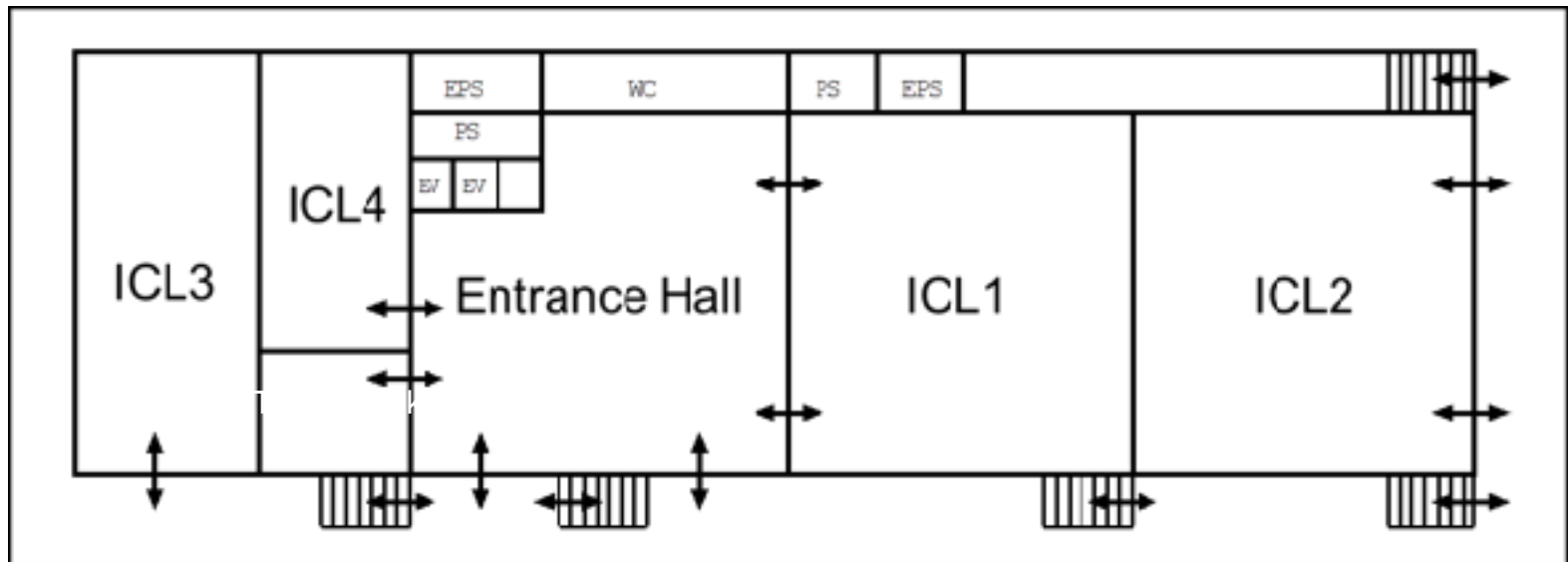
- Translated into English by Takeshi Tokuyama
- Further edited by me

# Course Overview

- Contents
  - Basic knowledge on information technology
    - Usage of computer
    - Ofimatic software
    - The Internet
    - Programming
  - Information society and information ethics
  - Basic usage of a computer (today's goal)
  - Learn the potential of a computer
- Evaluation
  - Assignments (and Attendance)

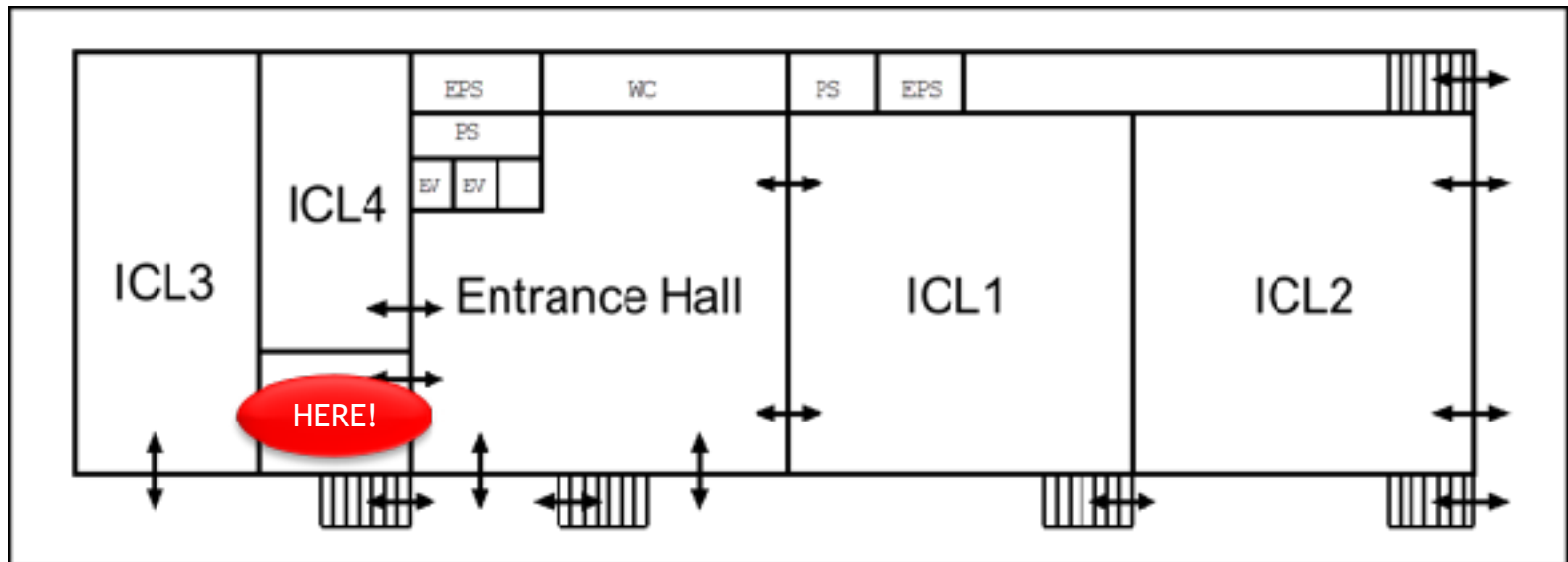
# MultiMedia Building

- ICL rooms are open except during lectures
  - ICL1 8:50-17:50 Linux/Windows\*152
  - ICL2 8:50-20:45 Linux/Windows\*152
  - ICL3 8:50-17:50 Linux/Windows\*55, MacOS\*2
  - ICL4 8:50-20:45 MacOS\*20



# MultiMedia Building

- Technical Assistants are available for your question
  - 09:00-17:50 Assistant room(red circle below)
  - 18:00-20:45 ICL2,3



# Computer system in Campus

- Operating System

- Windows

You know all of this

- Secure

- **Attention!**

- Computers are powerful tools
  - Can also be harmful
  - Handle with ethics and responsibility

# Basic Usage of Windows

- Desktop environment
  - Mouse operation
  - Application startup
- Application example
  - Command prompt: programming
  - Text editor: Word
  - Spreadsheet: Excel
  - Presentation: PowerPoint
  - Internet Browser: Fire Fox, Chrome, Tor

Don't use Microsoft explorer



# Linux

- Common Desktop Environment(CDE)
  - Visual environment (windows-like)
  - More powerful via command line
- Application examples
  - Terminal: command line operation, programming
  - Text editor: K write
  - Mailer
  - Internet browser

**TDLR: More complicated and powerful**

# Login



You know all of this



- Turn on machine and display
  - Select an OS(Linux or Windows)
- Enter your user ID and password

# User ID and Initial Password

- User ID
  - Allocated by system administrator
  - Two different IDs
    - Tohoku University ID
    - Student ID
- Password
  - Decided by user
  - **NEVER share**
- Initial Password
  - Given by system administrator
  - Generated from your personal information
  - **Change immediately**

# 1 利用者番号と初期パスワードについて

教育用電子計算機システムを利用するためには、利用者番号と初期パスワードが必要です。

(例)

学籍番号: **A9JB1234** 生年月日: **1990年1月1日**

名前: **徳山 (トクヤマ)** 出身高校所在地: **東京**

- 利用者番号には、学籍番号 (アルファベットは小文字) を利用します。

利用者番号は **[a9jb1234]**

- 初期パスワードは、各自、手計算により算出します。算出方法は、裏面を参照して下さい。

# 初期パスワードの算出

(例)

学籍番号: **A9JB1234**

生年月日: **1990年1月1日**

名前: **徳山(トクヤマ)**

出身高校所在地: **東京**

図1

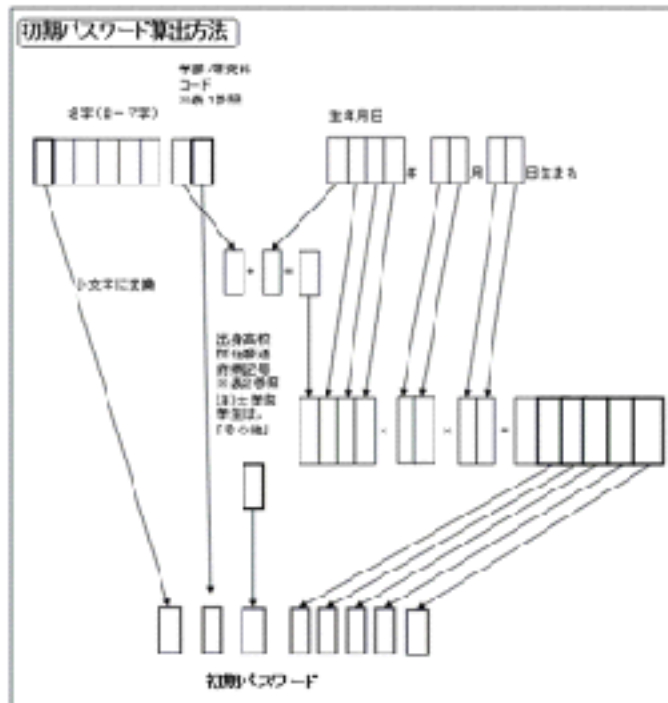


表1. 学部/研究科コード一覧

コード	学部/研究科名
01	文学部
02	教育学部
03	法学部
04	経済学部
05	理学部
06	医学部
07	工学部
08	農学部
09	工学部
10	農学部
11	文学研究科
12	教育学研究科
13	法学研究科
14	経済学研究科
15	理学研究科
16	医学部研究科
17	工学研究科
18	農学研究科
19	工学研究科
20	農学研究科
21	国際文化研究科
22	情報科学研究科
23	生命科学研究科
24	国際情報学部
25	環境科学研究科
26	医療技術短期大学部

表2. 出身高校所在地都道府県記号一覧

都道府県	記号	都道府県	記号
北海道	a	大阪府	A
青森県	b	兵庫県	B
岩手県	c	奈良県	C
宮城県	d	和歌山県	D
秋田県	e	鳥取県	E
山形県	f	徳島県	F
福島県	g	岡山県	G
茨城県	h	広島県	H
栃木県	i	山口県	I
群馬県	j	徳島県	J
埼玉県	k	香川県	K
千葉県	l	愛媛県	L
東京都	m	高知県	M
神奈川県	n	福岡県	N
新潟県	o	佐賀県	O
富山県	p	長崎県	P
石川県	q	熊本県	Q
福井県	r	大分県	R
山梨県	s	宮崎県	S
長野県	t	鹿児島県	T
新潟県	u	沖縄県	U
静岡県	v	その他	V
愛知県	w	留学生	
三重県	x	大検合格者	
滋賀県	y	大学教員	
京都府	z		

注) 計算結果、6桁に満たない場合は、5桁になるように先頭に0をつけること。

# 初期パスワードの算出

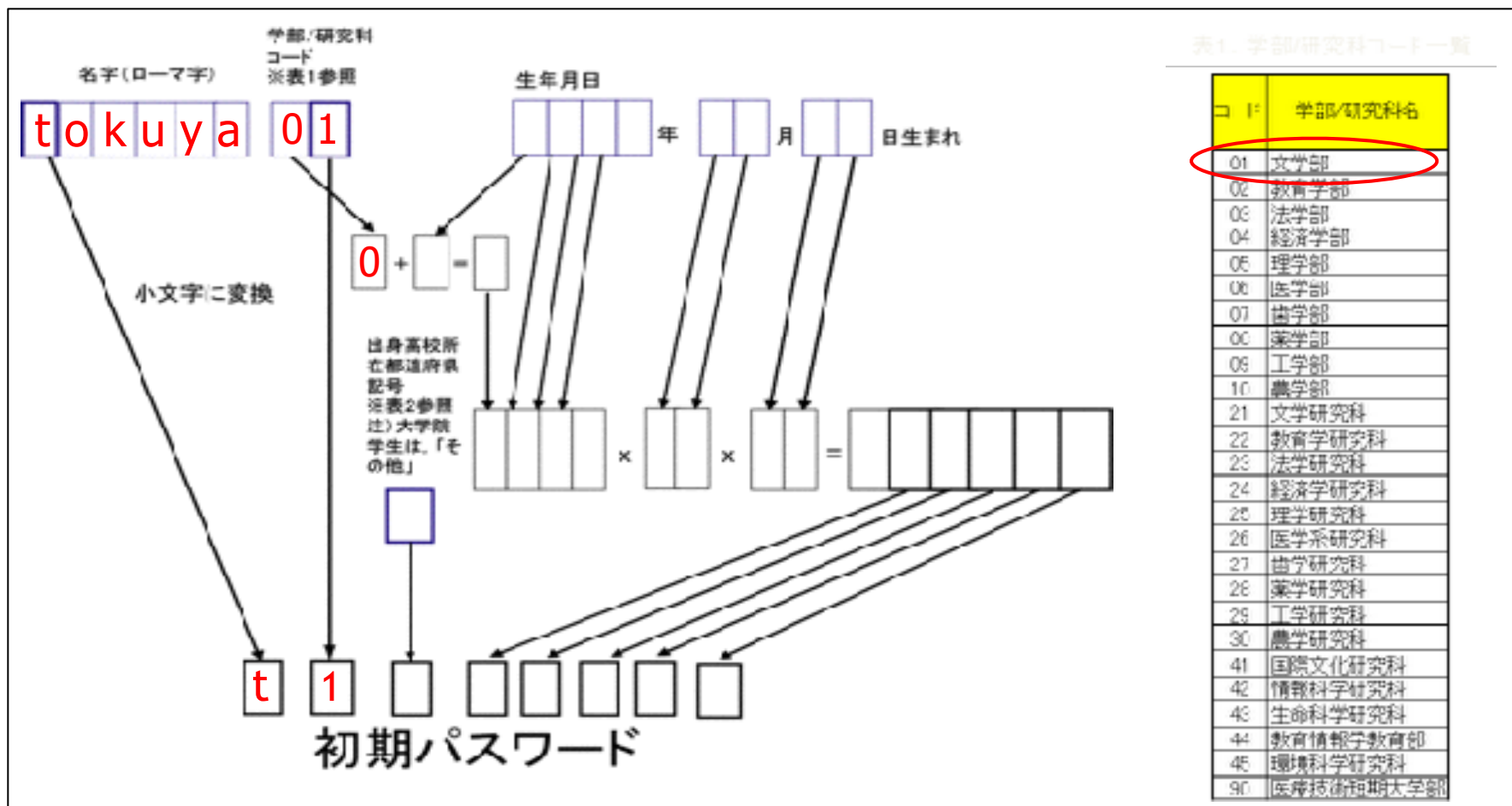
(例)

学籍番号: **A9JB1234**

生年月日: **1990年1月1日**

名前: **徳山(トクヤマ)**

出身高校所在地: **東京**



# 初期パスワードの算出

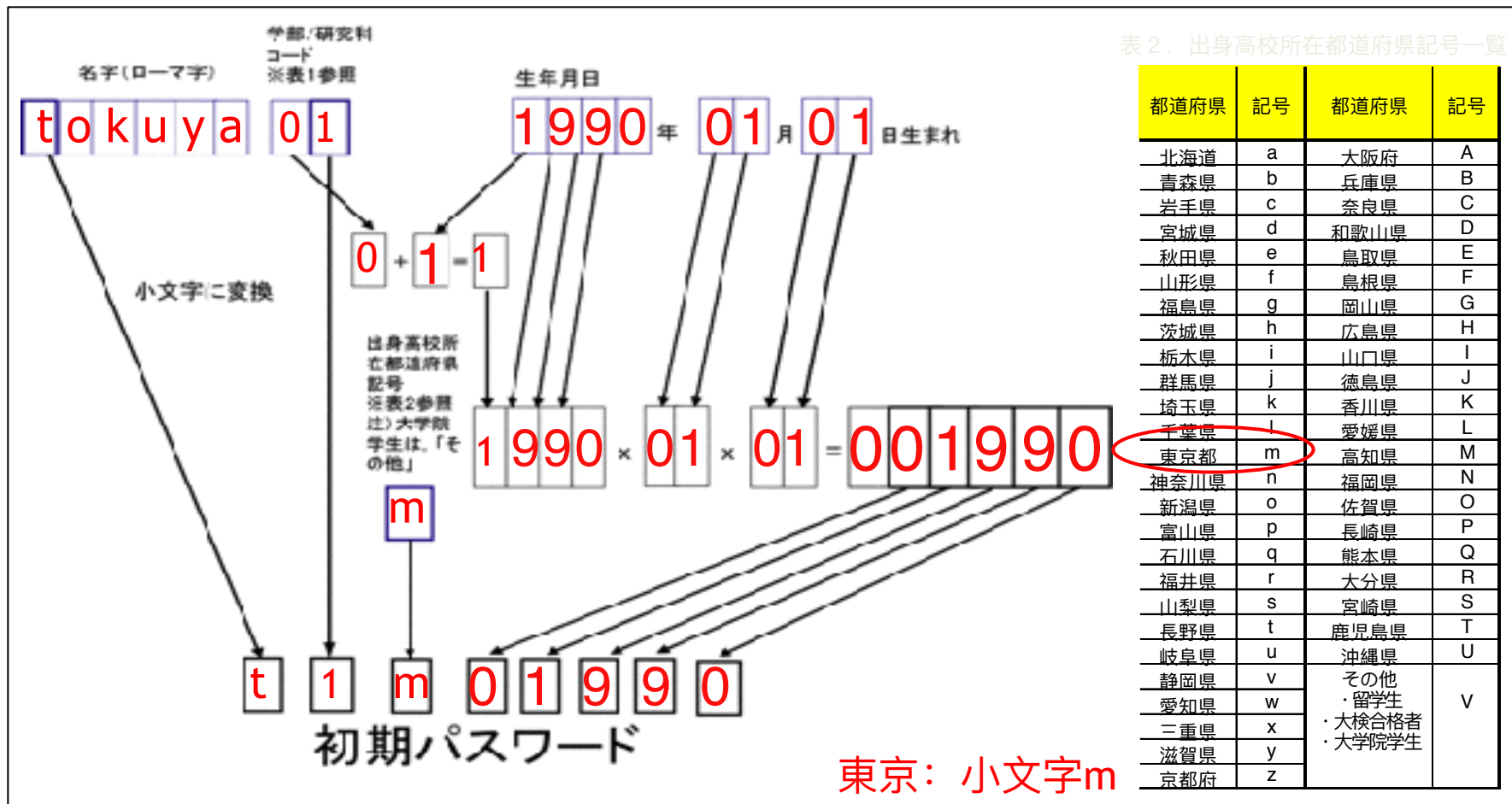
(例)

学籍番号: **A9JB1234**

生年月日: **1990年1月1日**

名前: **徳山(トクヤマ)**

出身高校所在地: **東京**



# Initial Password

Anyone can generate from your basic information.  
Leaving initial password can cause

**ACCOUNT HACKING**

Change it NOW at “Integrated Electronic Authentication System Login” in CITE website



# Compliance

Be specially careful when using university computers

- No online purchases
- No movie downloading
- Don't send missiles to North Korea
- Don't print counterfeit money

You know all of this

# Course Registration

- Open your Internet Browser
  - Go to “Teaching Support System” in CITE website
  - Login and click course registration
- Only registered user can use PC in a course (otherwise forced to logout)

This registration is only valid in Multi Media Building and not related to grading system.

# Homework

- Prepare a 5 minute presentation
- Topic: Information Society and Ethics

Important! Counts for final grade!

- Give your opinion
- Possible solutions
- Make slides in (preferably PDF)
- Deadline: 16 October

# 情報基礎B (Computer Literacy)

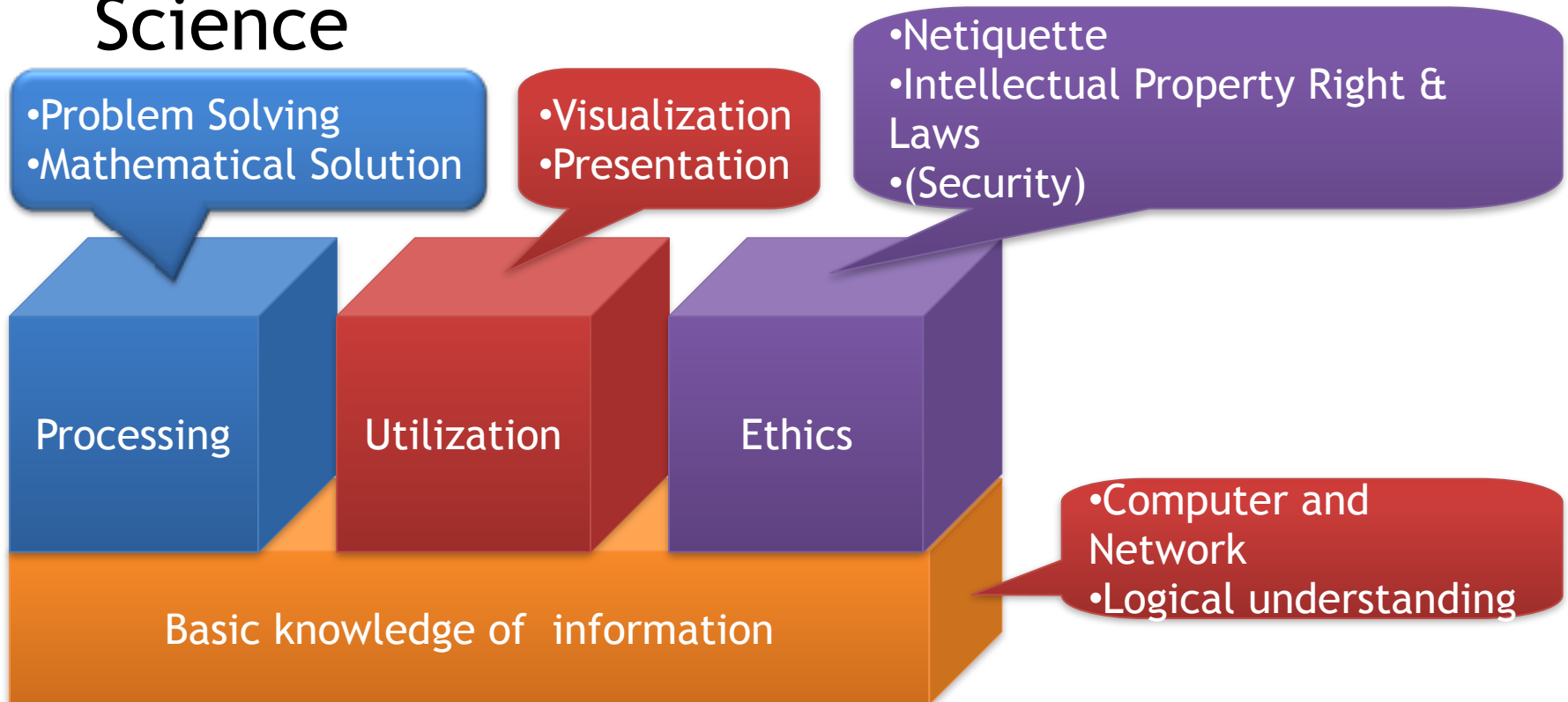
## Lecture 2: Ethics and Security

Matias Korman

Tohoku University Graduate School of Information Sciences  
System Information Sciences  
Design and Analysis of Information Systems

# Course Overview

- Acquisition of basic knowledge on Information Technology and Information Science



# Course Information

- Mostly Slides
- Exercises done in class
- Classic textbook
- Internet
- Handouts

Print out limitation is 120 Pages/  
Semester

# Information Ethics

- Ethics
  - Right attitude as a human in society

Do not harm others

(Justice) · 礼(Politeness) · 智(Wisdom) · 信(Honesty)

- Information Ethics

Do not harm others using computers

Not even by accident!

# Information in Society

- Humanity has evolved along with information
- Major evolutions
  - Language
  - Paper+Pen
  - Printing
  - (physical) mail
  - Telegram
  - Telephone
  - ...
  - Internet
    - Email, Web, Blog, Twitter, Facebook
- Human culture depends on information infrastructure and information exchange



# Information in Society

- Humanity has evolved along with information
- Major evolutions
  - Language
  - Paper+Pen
  - Printing
  - (physical) mail
  - Telegram
  - Telephone
  - ...
  - Internet
    - Email, Web, Blog, Twitter, Facebook
- Human culture depends on information infrastructure and information exchange

# Benefits and Risks of the Internet

- Benefit
  - World wide scale
  - Lots of information available
  - Easy to publish and share
  - Make distances shorter
  - Each person takes part in a huge events
    - Facing unspecified large number of people
- Risk
  - Individual act leads to a large effect
  - Many malicious uses
  - Small mistakes have big impact
- With great power comes great responsibility
- Use internet wisely

# Is this new?

- First documented case is in December 1941
  - Pearl Harbor
  - Japanese destroyed eight battleships
  - High presence in media
  - “Forced” US to join WWII
- Now happens in a larger scale
  - Russia interference in US election
  - Police tweeted “about to raid a terrorist cell”
  - Clickbait news
  - Need to be “first”
- Everyone can access a large audience easily
  - Everyone should study information ethics!

# What can we do?

- LEARN
  - Do not believe any news you see
  - Numbers can be easily tweaked
  - Small mistakes have big impact
  - Try to contrast the news
  - Be mindful of “schauensfreude”
  - Do not share if you are not certain
    - Most people only read caption
- With great power comes great responsibility
- Use internet wisely

# Crimes one may commit

- Violation of Privacy
  - Stronger than freedom of speech
  - Disclosing a private life of others  
(tweet the location of a famous person)
- Defamation
  - Blaming, Discrimination  
(you could go to jail for trolling!)
- Piracy
  - Using information from others without permission
  - Putting your photo of a celebrity
  - Your computer used as spambot
- Gambling, trickery, pyramid selling
  - Your loss fuels loss for others

# Illegal acts we ALL do daily

- Registering in some website with a fake name
  - 5 to 20 years!
- Using an open wi-fi without consent
  - Open does not mean “please use”
- Posting someone else’s image
  - Giving credit is not enough
- Sharing password with family
  - My wife cannot benefit from my Netflix!
- Registering with a fake name
  - 5 to 20 years!
- Selling on eBay
  - Did you declare taxes?

# Law point of view

- Prohibited by law
  - Human rights violation (right to privacy, to be forgotten, etc)
  - Easier than regular crimes
    - You do not see anyone suffer
    - Easy to anonymize
- Unconscious misconduct
  - Lack of awareness is your fault
- Unethical acts should be avoided

Don't hack your professor's PC!

# How to make a good password?

**WINDOWS:** Please enter your new password.

**USER:** cabbage

**WINDOWS:** Sorry, the password must be more than 8 characters.

**USER:** boiled cabbage

**WINDOWS:** Sorry, the password must contain 1 numerical character.

**USER:** 1 boiled cabbage

**WINDOWS:** Sorry, the password cannot have blank spaces.

**USER:** 50boiledcabbages

**WINDOWS:** Sorry, the password must contain at least one upper case character.

**USER:** 50FUCKINGboiledcabbages



# Internet Security

- Having a strong password is essential
- Letters and numbers
- Special characters
- Blood type
- Hair color
- Long password do not make your account safer!
- Do not use the same password in different pages
  - Use an algorithm
  - Even better: password manager

Is this enough?

# Internet Security

## Microsoft » Windows 7 : Security Vulnerabilities

CVSS Score Greater Than: 0 1 2 3 4 5 6 7 8 9

Sort Results By: CVE Number Descending CVE Number Ascending CVSS Score Descending Number Of Exploits Descending

[Copy Results](#) [Download Results](#)

#	CVE ID	CWE ID	Exploits	Vulnerability Type(s)	Publish Date	Update Date	Score	Default Access Level	Access	Complexity	Authentication	Conf.	Integ.	Avail.
1	<a href="#">CVE-2015-0046</a>	<a href="#">22</a>	1	Dir. Trav.	2015-01-13	2017-09-07	9.3	None	Remote	Medium	Not required	Complete	Complete	Complete
<p>Directory traversal vulnerability in the TS WebProxy (aka TSWebProxy) component in Microsoft Windows Vista SP2, Windows 7 SP1, Windows Server 2008 R2 SP1, Windows 8, Windows 8.1, Windows Server 2012 Gold and R2, and Windows RT Gold and 8.1 allows remote attackers to gain privileges via a crafted pathname in an executable file, as demonstrated by a transition from Low Integrity to Medium Integrity, aka "Directory Traversal Elevation of Privilege Vulnerability."</p>														
2	<a href="#">CVE-2014-4114</a>	<a href="#">20</a>	3	Exec Code	2014-10-15	2015-10-08	9.3	None	Remote	Medium	Not required	Complete	Complete	Complete
<p>Microsoft Windows Vista SP2, Windows Server 2008 SP2 and R2 SP1, Windows 7 SP1, Windows 8, Windows 8.1, Windows Server 2012 Gold and R2, and Windows RT Gold and 8.1 allow remote attackers to execute arbitrary code via a crafted OLE object in an Office document, as exploited in the wild with a "Sandworm" attack in June through October 2014, aka "Windows OLE Remote Code Execution Vulnerability."</p>														
3	<a href="#">CVE-2014-4113</a>	<a href="#">254</a>	1	Priv.	2014-10-15	2017-09-07	7.2	None	Local	Low	Not required	Complete	Complete	Complete
<p>win32k.sys in the kernel-mode drivers in Microsoft Windows Server 2003 SP2, Windows Vista SP2, Windows Server 2008 SP2 and R2 SP1, Windows 7 SP1, Windows 8, Windows 8.1, Windows Server 2012 Gold and R2, and Windows RT Gold and 8.1 allows local users to gain privileges via a crafted application, as exploited in the wild in October 2014, aka "Win32k.sys Elevation of Privilege Vulnerability."</p>														
4	<a href="#">CVE-2013-3661</a>	<a href="#">22</a>	1	DoS Dir. Trav.	2013-05-24	2013-05-05	4.9	None	Local	Low	Not required	None	None	Complete
<p>The EPATHOBJ::LFlatten function in win32k.sys in Microsoft Windows XP SP2 and SP3, Windows Server 2003 SP2, Windows Vista SP2, Windows Server 2008 SP2 and R2 SP1, Windows 7 SP1, Windows 8, Windows Server 2012, and Windows RT does not check whether linked-list traversal is continuously accessing the same list. <b>Chrome and Firefox only- Download results in error of service (infinite loop)</b> via vectors that trigger a crafted PATHRECORD chain.</p>														
5	<a href="#">CVE-2013-3660</a>	<a href="#">119</a>	1	Overflow + Priv.	2013-05-24	2017-09-18	6.9	None	Local	Medium	Not required	Complete	Complete	Complete
<p>The EPATHOBJ::pprFlatLenRec function in win32k.sys in the kernel-mode drivers in Microsoft Windows XP SP2 and SP3, Windows Server 2003 SP2, Windows Vista SP2, Windows Server 2008 SP2 and R2 SP1, Windows 7 SP1, Windows 8, and Windows Server 2012 does not properly initialize a pointer for the next object in a certain list, which allows local users to obtain write access to the PATHRECORD chain, and consequently gain privileges, by triggering excessive consumption of paged memory and then making many FlattenPath function calls, aka "Win32k Read AV Vulnerability."</p>														
6	<a href="#">CVE-2013-1300</a>	<a href="#">254</a>	1	Priv.	2013-07-09	2017-09-18	7.2	None	Local	Low	Not required	Complete	Complete	Complete
<p>win32k.sys in the kernel-mode drivers in Microsoft Windows XP SP2 and SP3, Windows Server 2003 SP2, Windows Vista SP2, Windows Server 2008 SP2 and R2 SP1, Windows 7 SP1, Windows 8, Windows Server 2012, and Windows RT does not properly handle objects in memory, which allows local users to gain privileges via a crafted application, aka "Win32k Memory Allocation Vulnerability."</p>														
7	<a href="#">CVE-2013-0008</a>	<a href="#">254</a>	1	Priv.	2013-01-01	2017-09-18	7.2	None	Local	Low	Not required	Complete	Complete	Complete
<p>win32k.sys in the kernel-mode drivers in Microsoft Windows Vista SP2, Windows Server 2008 SP2, R2, and R2 SP1, Windows 7 Gold and SP1, Windows 8, Windows Server 2012, and Windows RT does not properly handle window broadcast messages, which allows local users to gain privileges via a crafted application, aka "Win32k Improper Message Handling Vulnerability."</p>														
8	<a href="#">CVE-2011-3046</a>	<a href="#">20</a>	1	DoS Exec Code Mem. Cor.	2011-12-30	2017-09-18	9.3	None	Remote	Medium	Not required	Complete	Complete	Complete
<p>The Graphics Device Interface (GDI) in win32k.sys in the kernel-mode drivers in Microsoft Windows XP SP2 and SP3, Windows Server 2003 SP2, Windows Vista SP2, Windows Server 2008 SP2, R2, and R2 SP1, and Windows 7 Gold and SP1 does not properly validate user mode input, which allows remote attackers to execute arbitrary code or cause a denial of service (memory corruption) via crafted data, as demonstrated by a</p>														

# Internet Security

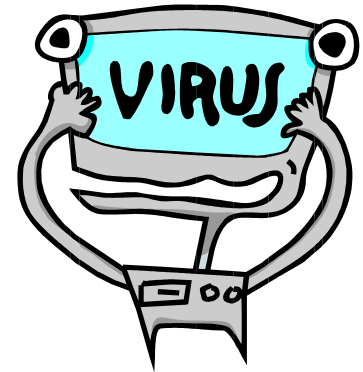
- Security does not depend only on you
  - Even with Firewall and Anti-virus
  - Day 0-vulnerabilities can affect any computer
    - Sell for 200.000\$ on black market
    - Update all software!
  - NSA spying on all of us
  - How much data do you have online?
    - One disgruntled employee is all it takes
  - Most nuclear power plants are **infected**
    - Not even aware of them

# Security Example 1

- While browsing through internet I saw an add  
Your computer is infected,  
try our antivirus for free!
- Install the program and computer slows down
- Pay for the pro version and no more problems!

# Malware (Malicious Software)

- Malware
  - Old ones would destroy your data
    - Possibly ask for ransom money
  - New ones give your information
- How to get infected
  - USB
    - Plug & play devices
  - Internet
    - Downloaded file
    - E-mail attachment
    - Logging to “Free\_wifi” network
    - Man in the middle
    - Hard Drive swap
  - Software vulnerabilities
    - always update software!



# What can they do?

- Steal your money
  - They probably don't care
  - Your account is payment for other transactions
- Steal your information
  - friends are potential targets
- Destroy data, ask for ransom money
  - WannaCry, Pirates of the Caribbean 5
- Blackmail
  - Do you want your drunk images on Facebook?
  - Have you ever cheated on your boyfriend/girlfriend/dog?
- Become figurehead for larger crimes
- Identity theft
  - Someone could do this course instead of you!

# Security Example 2

- Google workers in China use new laptops
- Use computer as little as possible
- Never type passwords with keyboard
  - Use USB authentication
  - Shower with USB
- Throw computer when returning home
- Aren't virus only programs?

How much security do you need?

# Security Example 3

- Why was Bin Laden hard to find?
  - He never accessed internet
  - carry a USB key to internet cafe
  - 30 Drive each way

Not practical for us.

Make it not worth the effort!



# Self Defense Summary

- Very hard/impossible to be secure
- Make it not worth for hackers
- Never stop learning
- National Police Agency Japan Countermeasure against Cybercrime
  - <http://www.npa.go.jp/cyber/english/index.html>
- National Consumer Affairs Center of Japan
  - [http://www.kokusen.go.jp/ncac\\_index\\_e.html](http://www.kokusen.go.jp/ncac_index_e.html)

# Spam Mail

- 97% of all mail is unwanted
  - Most of it are adds
  - 99.99999% of them end in spam folder
  - 46% of people open them
  - 11% of them click
  - ??% end up in a purchase
- Millions of dollars in benefits!!
- Imagine how fast would internet can be?
- Never support them!

# Data Privacy

Or why is Facebook free?

# Privacy in Social Networks



Frank

Since Facebook is now an open capital entity and in response to the new Facebook guidelines, I, \_\_\_\_\_, hereby declare that my copyright is attached to all of my personal details, including but not limited to illustrations, designs, paintings, renderings, professional photos, business photo's and videos, etc. (as a result of the Berner Convention).

For commercial use of the above my written consent is needed at all times.

I notify Facebook that it is strictly forbidden to disclose, copy, distribute, disseminate, or take any other action against me on the basis of this profile and/or its contents. The aforementioned prohibited actions also apply to employees, students, agents and/or any staff under Facebook's pay, direction or control. The content of this profile is private and confidential information. The violation of my privacy is punished by law (UCC 1 1-308-308 1-103 and the Rome Statute). 11/25/12

# Why are Social Networks Free?

- Sell Ads
  - Targeted to specific audience
  - They learn a lot from you
    - What did you click?
    - Whose page do you stalk?
- Several known abuses
  - Selling information on you being sick
  - Sharing that you are homosexual
- How much would a paid SN cost?

# Other problems of SN

- Most people get news from social networks
  - Friends share news, more likely to believe
  - Friends think alike -> reinforce your opinion
  - Fake news (more than 50%?)
- Obama's war chest came from social media
- Russia influenced the US election through ads on Facebook
- People share explicit images during terrorist attacks
- Sharing pictures of your ex-boyfriend/girlfriend

# How can we be protected?

- Understand that anything you upload will become public
  - Even if sent privately
- Think before you share
- Tweak settings for extra privacy
- Remove metadata of images
- Close old accounts

# Further Study

- Movie/TV
  - Fifth Estate
  - Snowden
  - Black Mirror
  - Mr Robot
- Bruce Schneier blog on security (<https://www.schneier.com/>)
- Essays on Social Sciences (nerdwriter1)
- ...



# Remember the homework!

- Prepare a 5 minute presentation
- Topic: anything related to what I spoke
  - i.e., internet bullying
    - Introduce the problem
    - Give your opinion
    - Possible solutions
    - Make slides (PDF)
- **Deadline: 16 October**