The way to establish "University - Industry" collaboration in Japan

-Case of Tokyo University of Technology(TUT)-

2018.9.10

Koji Mikami
Tokyo University of Technology

Profile

Koji Mikami

– Professor, School of Media Science, Tokyo University of Technology

- Research Area
  - Research and development of the following areas
    - 2D/3D Animation
    - Game and Interactive Contents

- Society
  - ACM Siggraph（CG），Art and Science Society（Digital Contents），IPSJ（ICT），Digra Japan（Game），Japan Society of Animation Studies（Animation），and so on

Profile cont.

- Industry and Governmental activity as Professor
  - CEDEC(Computer Entertainment Developers Conference)
    - Committee Member(Academic Area)
  - AJA(The Association of Japanese Animation)
    - Committee Member
  - MPTE(The Motion Picture & TV Engineering)
    - Animation Committee Member
  - Governmental Project
    - Ministry of Economy, Trade and Industry
    - Ministry of Education, Culture, Sports Science and Technology
    - Agency for Culture Affair

Profile cont.

- Before Academic Career
  - Media business department of international trading firm (Nissho Iwai corp., known as “Sojitsu Corp.” today)
    - X-BAND: Online distance game play system and services for NES and SEGA Saturn
    - 3D Metaverse
  - Producer of MK Company
    - Producing PC Game
    - Digitalization of Anime Production
    - 3DCG for Hand Drawing Anime

X-BAND for SS

World Chat 1.0

War in the Pacific

Current Status

- University supplies excellent talent to the game industry
  - Game studio go to recruit students to University
  - Game Professionals sometimes became professor of University
    - Toru Iwatani (Packman) and Masanobu Endoh (Xevius) are professor of Tokyo Polytechnic University Faculty of Art
    - Hirokazu Yasuhara (Sonic) is Associate Prof. of TUT
- “CEDEC” (NO,1 game developer conference in Japan) has session category “Academic/Fundamental Technologies”
  - Number of accepted sessions from AC (2018:16) *Total 195
  - 10% of the attendee is university and vocational school students and staff

Cooperative relationship is being established

Agenda

- Game Education in Japan
  - Curriculum in TUT
- Industry Situation
  - CEDEC

Game Education in Japan

Question

- There are 764 University in Japan (2017)
  (82 National, 87 Public, 588 Private 7 others)

- How many University have faculty named “Game” something?
  – Game design, Game development, Game study, Game programing etc

More than 100?

51 – 99?

11 – 50?

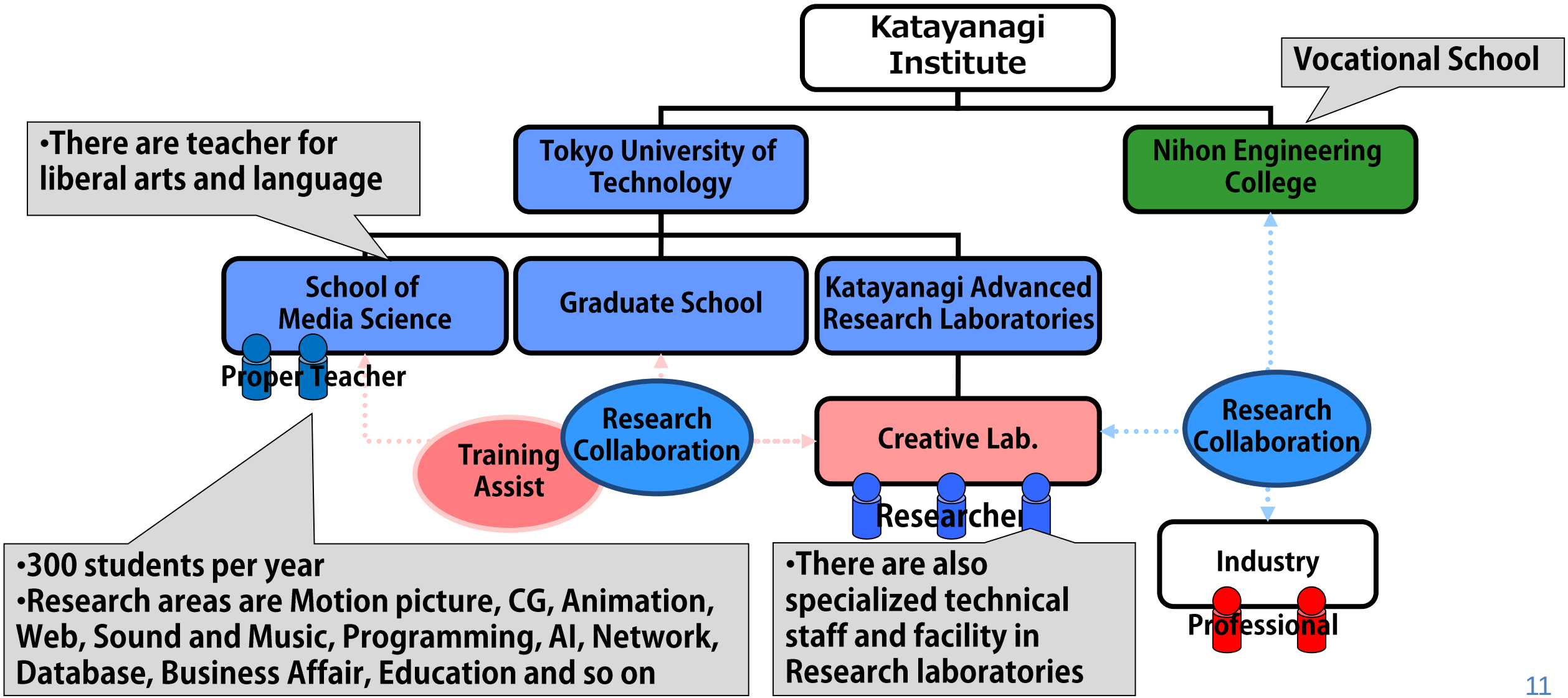
Less than 10?

Background of Education in Japan

- There are no “Faculty” includes name of “Game” in 4 year University
  - There are a few game “Section (2)” or “Course (less than 10) “
  - Many University uses framework of Informatics or Media Science
  - Curriculum restriction to establish new faculty by government
  - Strict requirement for teaching staff of new faculty (Ph.D degree, number of Journals)
- Many universities and researchers conduct game researches
- Most Game Development Education has conducted in Vocational School (almost 40 school) (Diploma or non-Diploma)

TUT Curriculum

Research and Education Scheme



Talents aimed at TUT

- Basic is "production experience" and "basic technical ability" + "bachelor's degree“
  - Consistent from contents education before game education begins
  - Beyond following current needs, create future needs

- Producer / Director in the future who can develop logical thinking with development capabilities and technical knowledge

- Innovative artists, engineers who can create new expressions and technologies

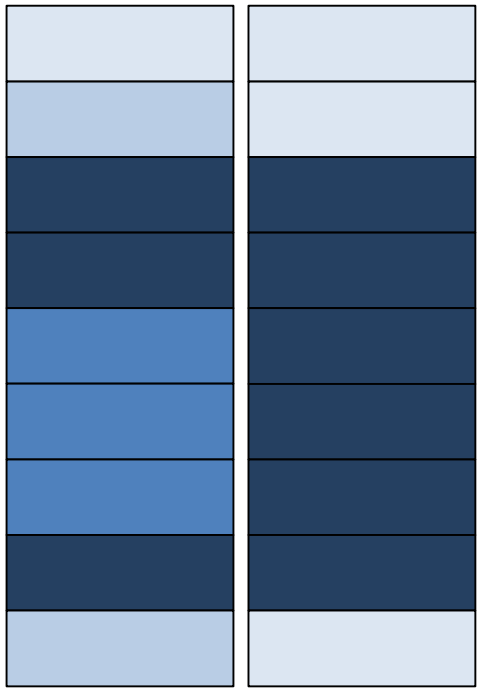
TUT Game Education and Research Heat Map

- Game Design, Programing, and Game Production Experience of IGDA Curriculum Frame Work are focused

IGDA Curriculum Frame work

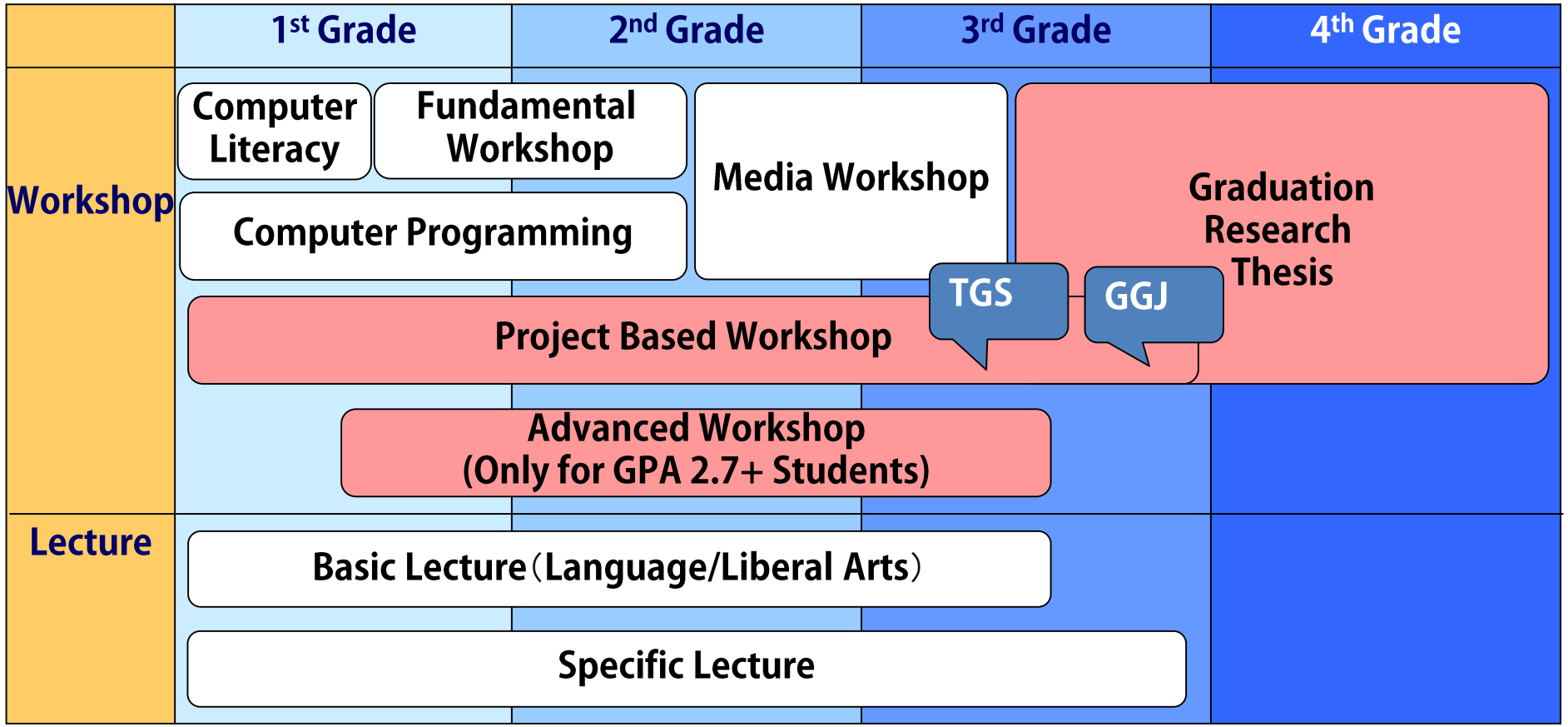
- Critical Game Studies
- Games and Society
- Game Design
- Game Programming
- Visual Design
- Audio Design
- Interactive Storytelling
- Game Production
- Business of Gamin

<TUT focus heat map>



Utilize Education Framework of School of Media Science

- We could start using help of Ministry of Education



Graduate School

Master (ME, MMSci)
Ph. D (E, MSci)

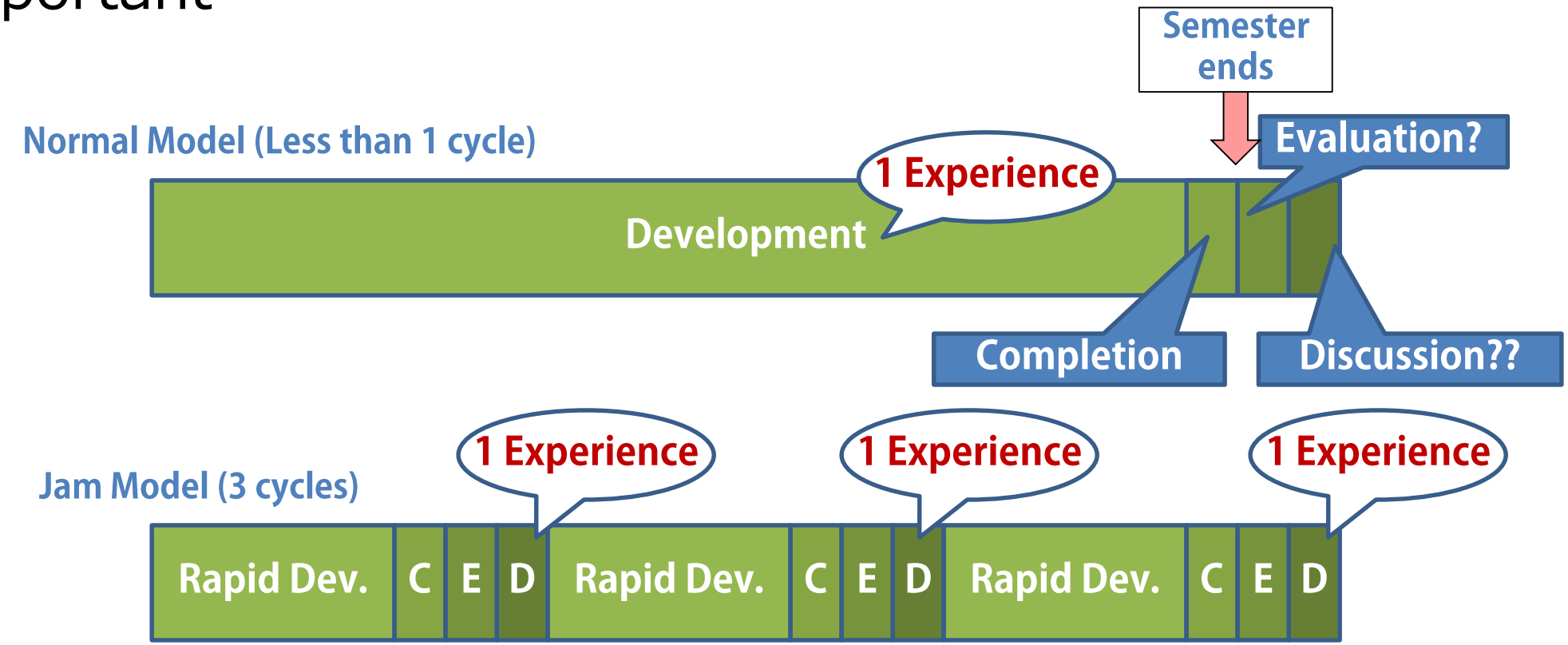
カシカセカイ

Magi@

Game and Computer Animation is mainly trained as a project based Workshop

Game Jam Style Education

- Lots of experience from total game production
- Completion (Finishing), Evaluation and Discussion are Important



Global Game Jam

- We have hosted GGJ venue since 2010 (Pioneer in Japan)
- Junior, Senior and Graduate students collaborating with Engineering college student and Industry experts
- Many Professionals join our venue
  - They start their own Game Jam in their studio (SEGA, BNG, Capcom and so on)

Journal Regarding Game Education

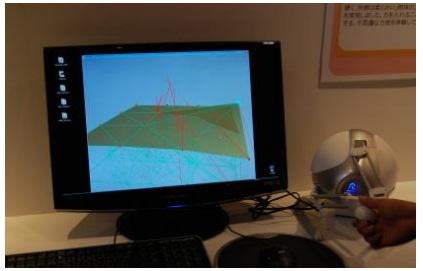
- Construction trial of a practical education curriculum for game development by industry-university collaboration in Japan
  - Computers and Graphics Volume 34 Issue 6, December, 2010, Pages 791-799
  - https://dl.acm.org/citation.cfm?id=1891110

There are link in my web
http://mkmlab.net

- Effectiveness of Game Jam-based iterative program for game production in Japan
  - Computers & Graphics Volume 61, December 2016, Pages 1-10
  - https://www.sciencedirect.com/science/article/pii/S009784931630086 3#!

Result

- First successful example for 4 year game development curriculum
  - Obtain Governmental fund many times
  - Students could create original game and awarded
  - Students could publish journal and awarded
  - The Curriculum and Education Material also awarded by IPSJ (the biggest IoT society in Japan)
  - TUT became core venue of “Global Game Jam”



My Lab. Students Working in Industry

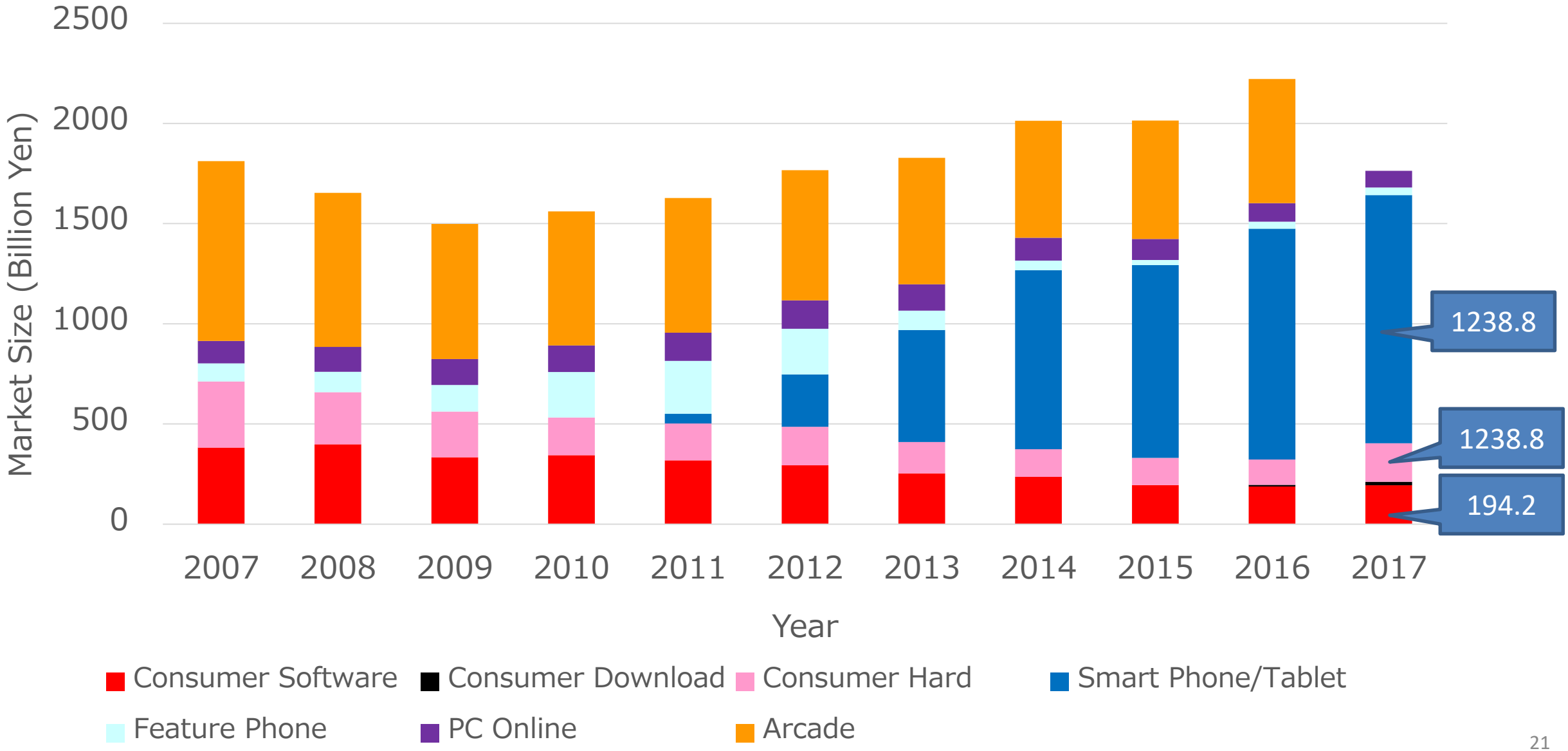
- Games
  - Satoshi Ban, Producer of “Sony Interactive Entertainment” CEDEC AWARD Jury
  - Kenneth Chan, Game Designer of “From Software”
  - Takashi Matsuo, Technical Artist of “Cyber Connect 2”
  - Ryo Watanabe, Sound Designer of “Ace Combat” CEDEC Member
  - Working most of game publisher and developer

SONY COMPUTER, BANDAI NAMCO, LEVEL5, コロプラ, Cygames, CyberConnect2, SEGA, KONAMI, DeNA, ACTIVISION BLIZZARD, FROM SOFTWARE, SQUARE ENIX, KT

- Animation and Feature Film
  - Yoshitaka Takeuchi, 3D Director of “Your Name.”
  - Toshio Yoshikawa, Production MGR of Studio Ghibli “Princess Kaguya”

Industry Situation

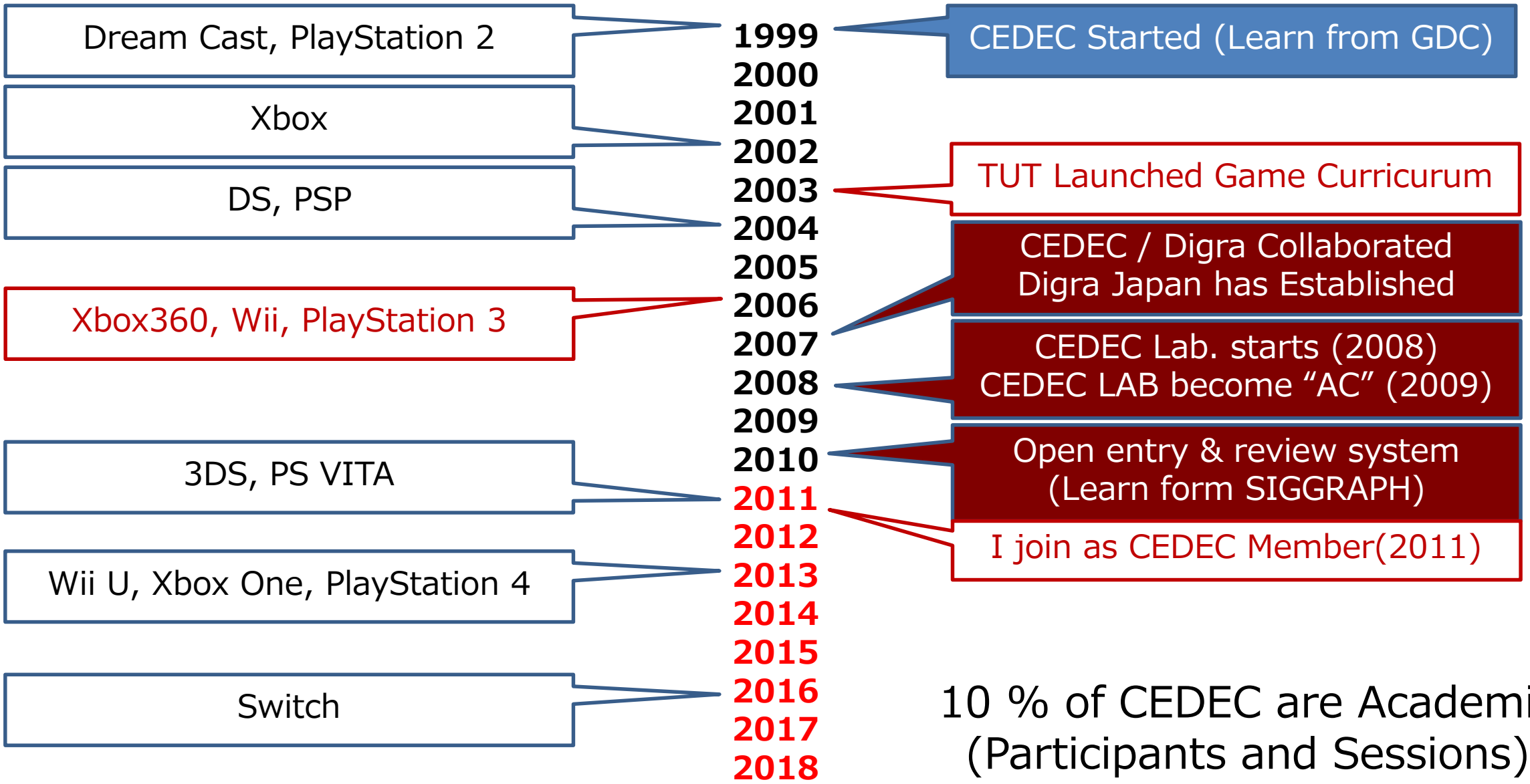
Trend of Japanese Game Market



CEDEC

- CEDEC is the most biggest game developer conference in Japan
  - 7,997 participants, 195 sessions in Engineering, Visual Arts, Game Design, Production, Business, and Academic area
  - Keynote by Shigeru Miyamoto (Nintendo)

Changes in Academic field of CEDEC



10 % of CEDEC are Academic
(Participants and Sessions)

Recommendation

- Academic
  - Focus not only following current needs, create future needs
    - Students and young developer easy to get current technique via Internet
  - Participate industry conference and make friendship
- Industry
  - Utilize academic R&D power
    - Their R&D are sometimes useless for present implementation
  - Participate academic conference and make friendship

Raise a place both Industry and Academic could join like ID. GAGA where you can think the future of game in Indonesia and Continue it

Conclusion & Thank you

- Academic has already a part of Game Industry in Japan
- Do not follow too much but understand and collaborate each other and continue it

Contact

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URL: http://mkmlab.net/

(I will put my full version of presentation and some manuscript on my web site)

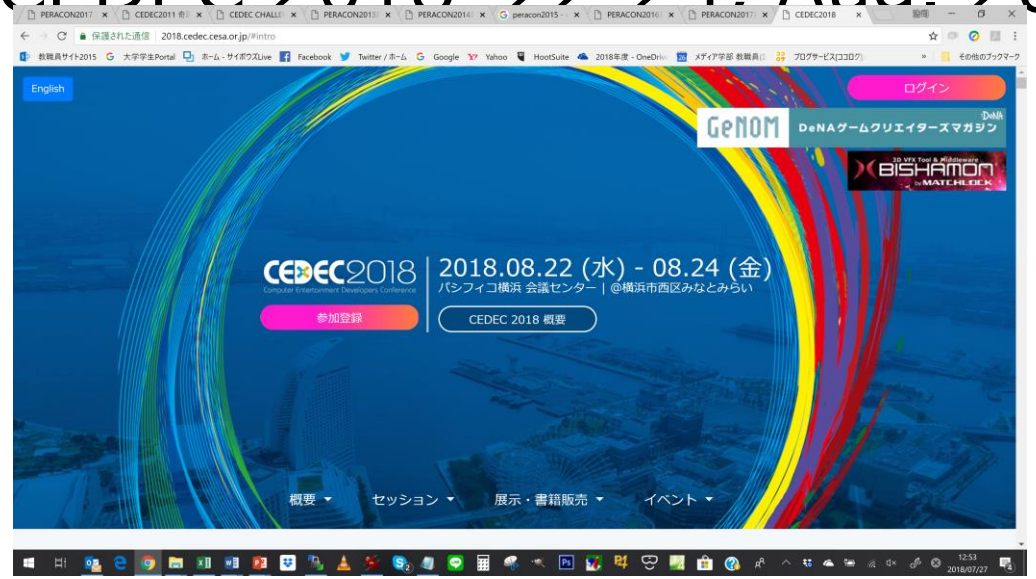
Our Method

- Peracon (A concept sheet contest) at CEDEC
  - “Pera” means 1 sheet
  - Competition by 1 page (A4 or Letter size) concept sheet
  - CEDEC is one of the biggest game developers conference in Japan
- Judge by many famous Japanese Game Designer and Director
  - To keep Diversity of evaluation
- Archive all of the “Pera” and Comments from Judge
  - Students and young game designer can feel the thought of idea of skillful game designers to individual game idea
  - They also can learn “Diversity” (skillful game designers sometimes

CEDEC

- Game Developers Conference hosted by CESA
  - More than 200 sessions regarding Game Design, Engineering, Visual Arts, Sound, Production, Management, Business, Academic and so on
  - More than 7000 attendee for 3 days conference

- CEDEC 2018, 22-24, Aug, 2018 at Yokohama, Japan (M



List of Judge (Abstracted)

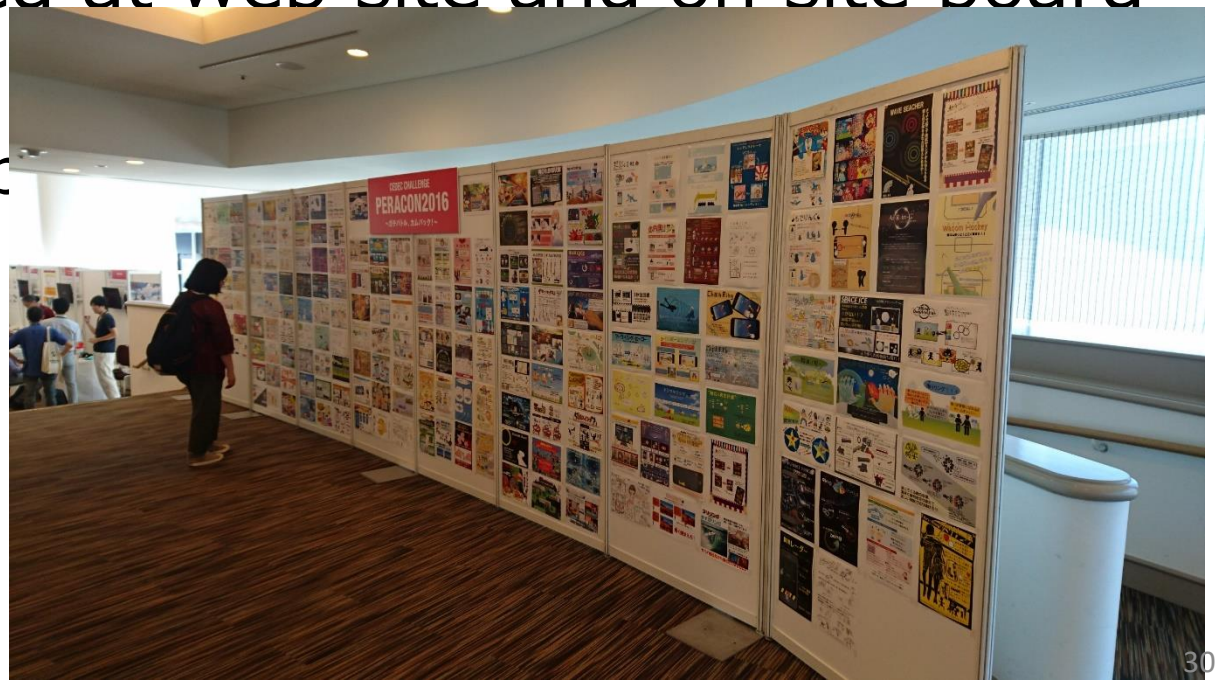
Name	Works	Name	Works
Masanobu Endoh(Digra) (Chair of “Peracon”)	"XEVIOUS", "The Tower of Druaga"	Hiroshi Matsuyama	".hack//G.U."
Takashi Hiraro	"Star Wars: Racer Arcade"	Tetsuya Mizuguchi	"Rez Infinite", "Chile of Eden"
Toshiyuki Hoi	"God Eater"	Yuji Naka	"Sonic the Hedgehog"
Yuji Horii	"Dragon Quest"	Yasuhito Nagaoka	"Gravity Days"
Mizuki Hosoyamada	"Puyo Puyo!! Quest"	Junya Okura	"Gravity Days"
Kazutoshi Iida	"Kyojin no Doshin"	Yosuke Shiokawa	"Fate/Grand Order"
Toru Iwatani(Digra)	"Packman"	Hiroyuki Sonobe	"Best Keiba Derby Stallion"
Kenji Kaido	"ICO", "Shadow of the Colossus"	Masanobu Suzui	"NES Remix"
Yuichi Kanemori	"KINGDOM HEARTS"	Goichi Suda	"Killer7", "LOLLIPOP CHAINSAW"
Koji Kenjo	"Custom Robo Battle Revolution"	SWERY (Hidetaka Suehiro)	"D4: Dark Dreams Don't Die"
Masahide Kitoh	"Dead Storm Pirates"	Takashi Tokita	"Chrono Trigger"
Yoshihiro Kishimoto (Digra)	"R.B.I. Baseball", "Baraduke"	Tomoyuki Yamada	"Uncharted Waters Online"
Kazutaka Kodaka	"Danganronpa V3: Killing Harmony"	Yohei Yanase	"Majin and the Forsaken Kingdom"
Hiroyuki Kotani	"Patapon"	Yuichi Yokoyama	"Blaze Union: Story to Reach the Future"
Yasumi Matsuno	"Tactics Ogre: Let Us Cling Together"	Koji Mikami(Digra)	

History of Peracon (1,038 submission)

Year	Submission	Theme	Theme reason
2011	57	Stopover (途中下車)	In memory of narrator narrator of the TV program using the same phrase
2012	92	Men and women simultaneously （男女同時）	In the 400-meter medley relay of swimming, men and women acquire medals simultaneously
2013	111	Temperature control （温度コントロール）	In memory of Yoshida, who served to cool down the Fukushima nuclear power plant
2014	157	Self-growth （自己増殖）	From Ice Bucket Challenge to support ALS
2015	242* （open entry）	Open （オープン）	Submission are open to everybody <normally attendee only>
2016	195	Ring/Ling （リング）	From the 5 rings of the Rio Olympics
2017	184	Baton touch （バトンタッチ）	Japanese athletes took medals at the world championship 400-meter relay

Submission

- Organizing Committee Provide Theme
  - Theme which is difficult to imagine the games as is
- Create concept sheet and upload it to the system or submit it on site
- Concept sheet will be displayed at web site and on site board



Judgement Rule

- Official Judge
  - Judgement by selected judge (skillful game designer and director, educator)
  - Official Judge just check “like” or “not” (almost within 15 seconds)
  - Judge will leave comments and select the candidate of Special Prize named them

- Open Judge
  - Judgement by audience of website
  - If official judge point is same, we consider open judge score
  - Official judge will usually review sorting by open judge score

2019 Best Sheet (184) "Guide: 10 seconds Robot"
Theme: Baton touch

Positive

Nagaoka
It is easy to understand what kind of game it is, it is a good impression that the theme is properly digested.
Besides making a foothold, if there are various uses of robo out of batteries, the depth as a puzzle will come out.
Watanabe
It seems that it will be interesting if you can arrange a gimmick so that the route to the goal is not too linear.

Negative

Yanase
The making of the proposal is very beautiful and good. Because the takeover action where corpses remain has a precedent, it is a pity that the novelty is weak. I wanted elements unique to robots

2013 Best Sheet(111) “Easy Tera Form”
Theme: Temperature control

Positive

Hiraro
I thought that the motif of temperature control is compatible with "garden observation type AI game". There were many competing proposals, but the project plan here is particularly wonderful in the world view.
A somewhat nostalgic image was [illegible] I felt outstanding! I

Negative

Mikami
I like this visual. But it is wasteful that the user can operate only the direct change in switch.
Yanase
The concept that terraforming can be done with a combination of living things to send is interesting, and the sheet is also very beautiful. But is it strange for themes to control living

2013 Rank 101 (Takahashi Awa
“Cool Sing Heat”

Positive

Takahashi
I like this kind of thing. You have to work hard on the system etc, but at the real live venue, everything will be able to control?

Negative

Matsuno
I think that the means of "singing songs well" and "singing poorly" are important, but it is regrettable that there is no reference to that means.

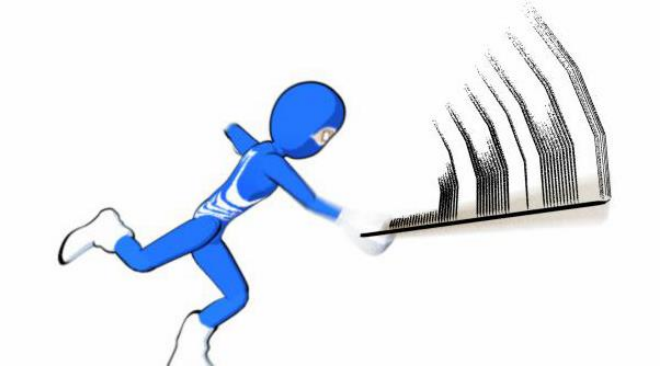
Swery
The temperature control is the result, and the center of the game is in the performance part, so it feels like changing ordinary rhythm games and dance gates.

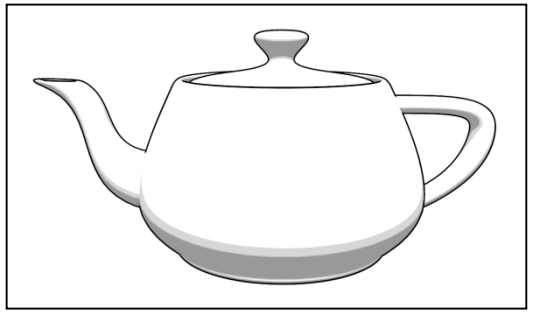
Miyagawa
The strategy method and the score are a little confusing.

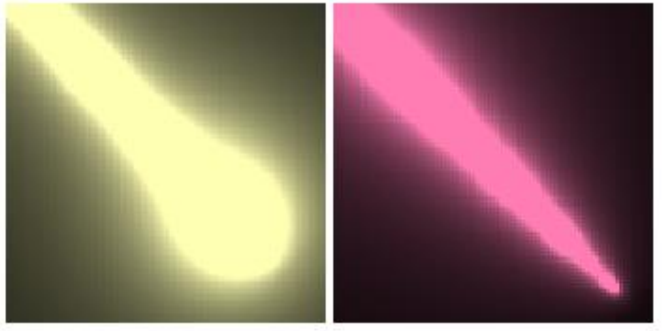
Result and Comments are archived

Further activity after Game Development (Bachelor and Master Thesis)

- R&D for Game Development, expression and so on
- Student have to find research theme which is new for everyone
  - New Game Design Method
  - Real-time CG (Especially Non Photorealistic Rendering)
  - Appling Manga and Anime technique to CG
- Research results will be presented in academic conference (IPSJ, ArtSCI and so on)







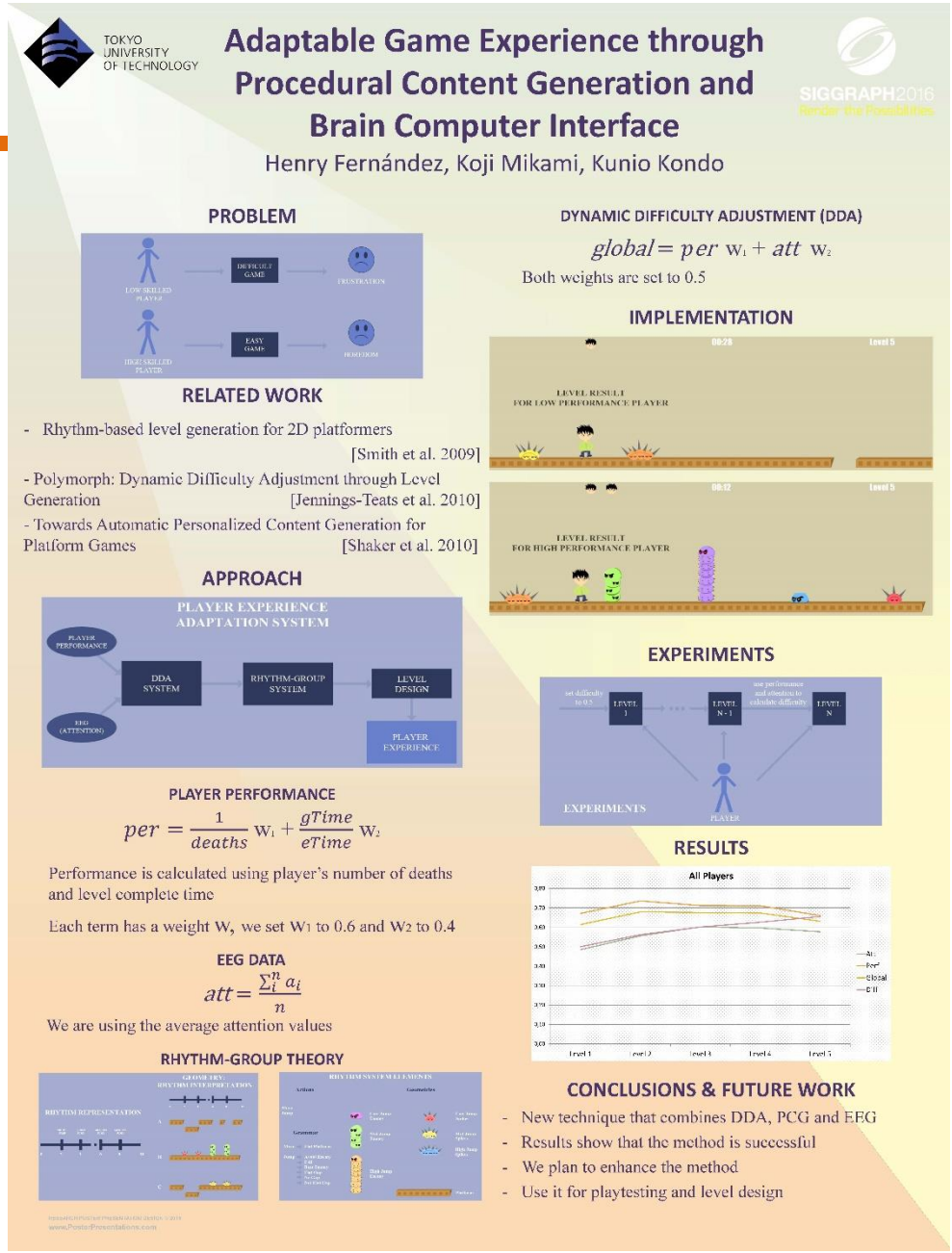
Procedural Level Generation

- Using player's score and EEG data
- Using Rhythm Group Theory[Smith, 2008]

Tokyo University of Technology

Adaptable Game Experience through Procedural Content Generation and Brain Computer Interface

Henry Fernández, Koji Mikami, Kunio Kondo



Against VR Sickness

- Realtime Blur in accordance with controller action

ベクションを考慮したマスクの応用による VR酔いの軽減と没入感の向上

東京工科大学メディア学部　コンテンツプロデューシング　千葉 瑞希
担当教員：中村 陽介 ・渡辺 大地 ・三上 浩司

はじめに

VRはユーザーにVR酔いなど不快感を与える恐れがある
視界の広りを高く抑むベクションマスクなど様々なＶＲ酔い対策が存在
視界を狭める対策のため、没入感や迫力の低下が懸念される

→ イメージエフェクトのみでVR酔い対策ができるシステムの実験を行う
→ 良い結果の得られたエフェクトを基に、さらに応用した手法の提案を行う

先行研究

(1)Oculusベストプラクティス
- Oculus本社の出したOculus Riftのガイドライン[i]

(2)『Eagle Flight』
- 『Eagle Flight』は、GDC2016に展示されたゲーム[ii]
- VR酔い対策としてベクションマスクを実装した

予備実験概要

- 次のイメージエフェクトを7名に遊んでもらい、評価を得た

予備実験結果

- 実験の結果、図1、図2より次の3点がわかった。
  - モーションブラーやビネット効果など建物の流れを隠す効果にはVR酔い軽減の効果が表れた
  - カラーコレクションのような色周りに関しては、彩度を強くするほど違和感を感じる人が多かった
  - ノイズのように過剰な効果付与は、目への負担が大きくなる

図1　イメージエフェクトによるVR酔いの調査

図2　イメージエフェクトによる違和感の調査

提案手法

- 予備実験結果を基に図3のような「モーションブラーマスク」の開発を行った

図3　モーションブラーマスク適用例

- モーションブラーマスクは以下の問題点を解決する
  - 映像酔いのリスクが高い近景の建物の流れを抑制[iii]
  - 図４の部分より外に適用することで重要な中心を邪魔しない

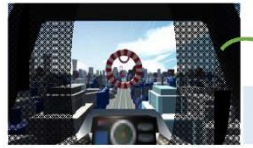


図4　モーションブラーマスク適用範囲

- 視野角44°内の情報が重要視されている[iv]

ゲーム化

- モーションブラーマスクの有用性を確かめるため、街の中を飛んで回るゲームを開発(図5)

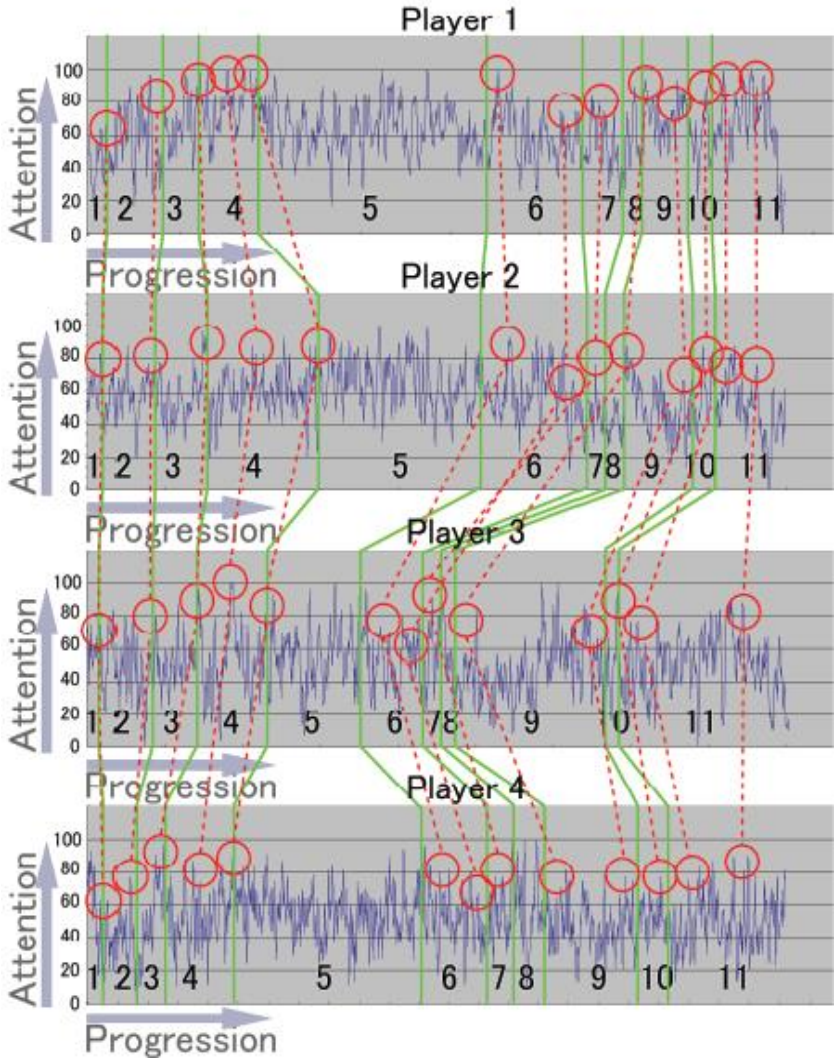
図5　開発したゲームの画面

~参考文献~
[i] Oculus本社 (2015). Oculusベストプラクティス. http://static.oculus.com/documentation/pdfs/jp/intro/latest/bp.pdf (2016年7月10日)
[ii] 佐藤カフジ (2016). GDC2016報告会. https://docs.google.com/presentation/d/1zv5NkTQLPh21FeNbcoVMr6Nx54nAKEIyWgmoRgL3MOs/edit#slide=id.p (2016年7月10日)
[iii] 広家私明(2015). 映像酔いの生起要因低減のためのガイドライン作成を目指して. http://home.c.ta.or.jp/device/linux/symposium/fpe_2015/pdf/40_yuie.pdf (2016年7月10日)
[iv] 須貝京(2014). 広視野角ヘッドマウントディスプレイ提示時におけるゲームアナウンスの適切な表示位置の探索. 修士論文, 16-39.

EEG Data Capture and Analysis for Game Design

Agenda

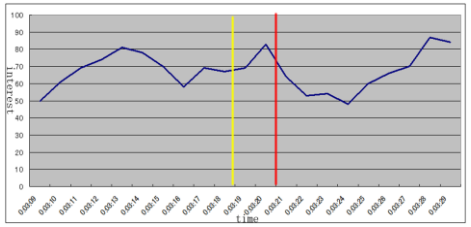
- Capture and Analyze the Brain waves (EEG)
- Find the mutual trend
- We extract 6 mutual trigger from FPS game



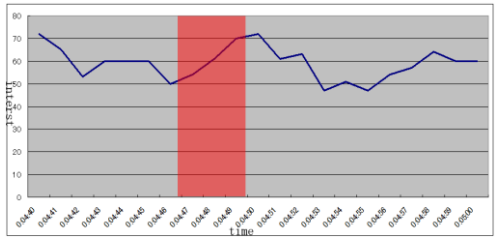
Agenda

6 Triggers which enchant game players

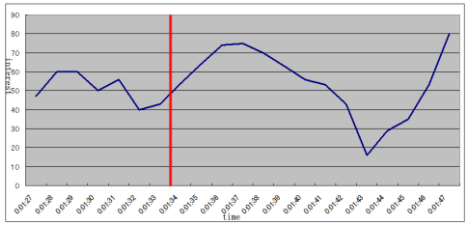
Anticipation:
Waiting for a predicted event, in favor of the player, to occur



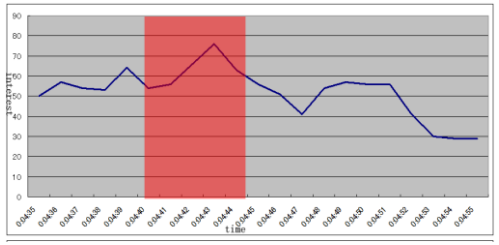
Frustration:
When the outcome of the player's actions is different from expected



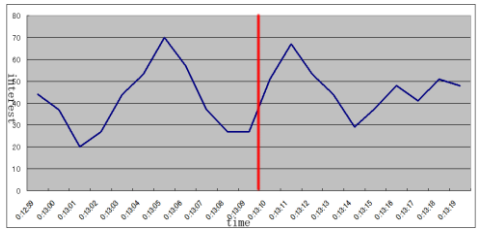
Surprise:
Sudden and dramatic change in situation, forcing player to adapt



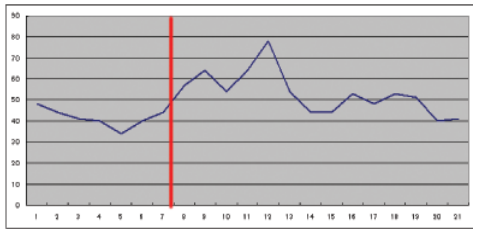
Overwhelm: Player is given a challenge greater than expected or able to handle



Concentration:
Concentrating on a completing a certain task



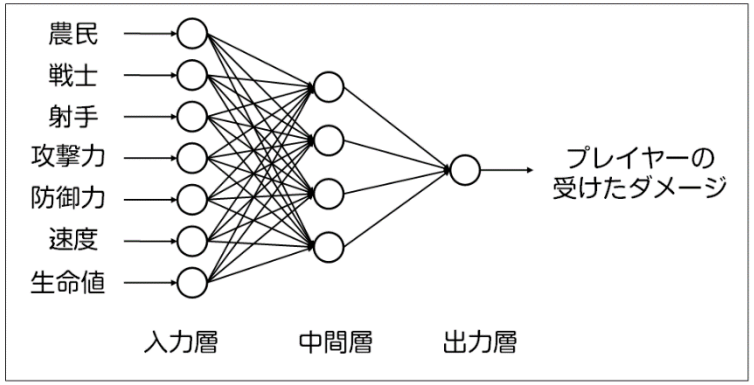
Fear: When player feels impending failure, or when failure becomes inevitable

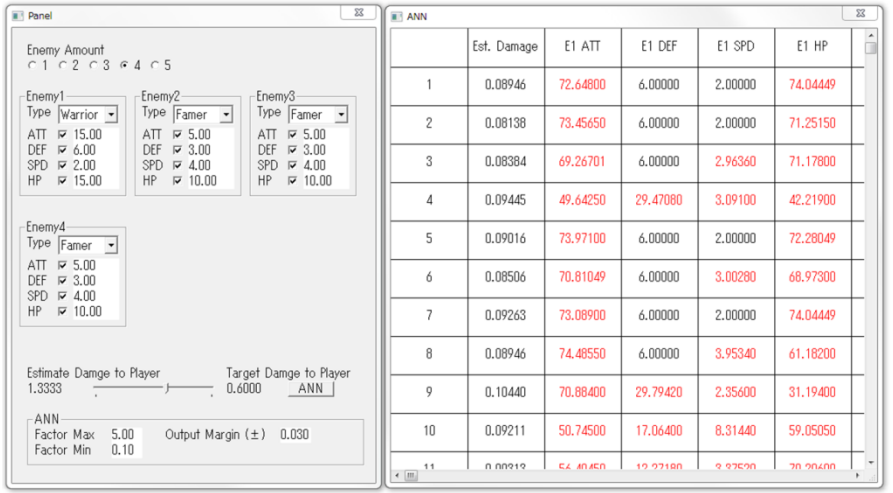


Agenda

Parameter Creation Using Neural Network

- Automatic Enemy Parameter Generation System





	Est. Damage	E1 ATT	E1 DEF	E1 SPD	E1 HP
1	0.08946	72.64800	6.00000	2.00000	74.04449
2	0.08138	73.45650	6.00000	2.00000	71.25150
3	0.08384	69.26701	6.00000	2.96360	71.17800
4	0.09445	49.64250	29.47080	3.09100	42.21900
5	0.09016	73.97100	6.00000	2.00000	72.28049
6	0.08506	70.81049	6.00000	3.00280	68.97300
7	0.09263	73.08900	6.00000	2.00000	74.04449
8	0.08946	74.48550	6.00000	3.95340	61.18200
9	0.10440	70.88400	29.79420	2.35600	31.19400
10	0.09211	50.74500	17.06400	8.31440	59.05050

Shape Oriented Line Drawing in Real-Time 3DCG

Agenda

- Anime and Manga technique for Game
- Calculate Curveture in real time
- Emphasis the line width I accordance with human line drawing