

# Emotion-aware教育システムのご紹介

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教育におけるXR(eXtended Reality)  
2023年3月7日



# 背景

- コロナ禍での教育

- 対面授業をオンライン授業やハイブリッド授業モードに移行した
- Synchronousやasynchronous授業モードでも学生のエンゲージメントやコンセントレーションのレベルを分かるのは難しくなった
- Students attending remotely were described as “behaving as if they were watching TV” (Raes et al., 2019, pp. 283)



# Learning analytics研究では

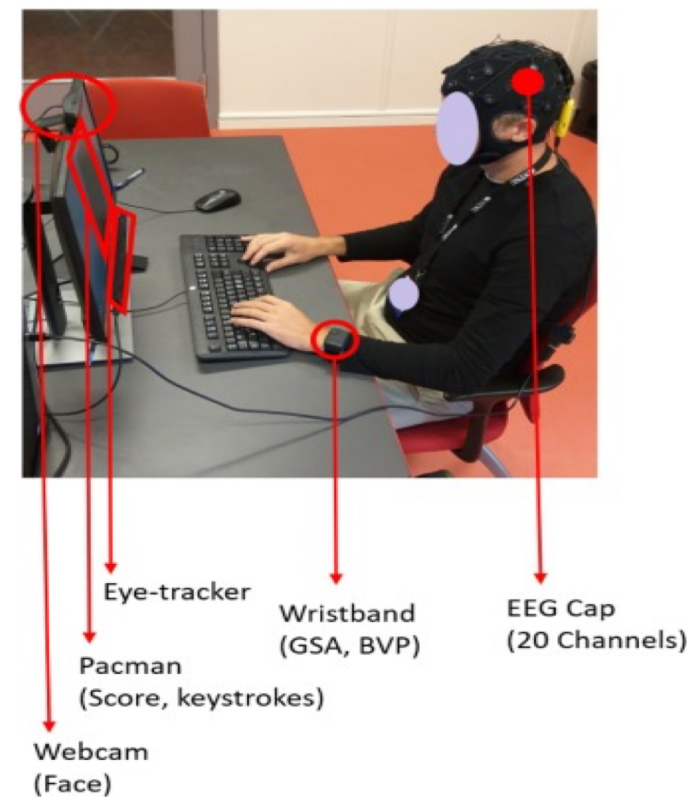
## LMSデータ



## Ebookデータ



## Health/Multimodal データ



# 法政大学のLMS

## • HOPPII (法政大学のLMS)

The screenshot displays the HOPPII LMS interface. On the left is a navigation menu with categories like 'Hoppil', '法政大学公式サイト', '大学院', '通信教育部', '図書館(蔵書検索など)', 'グローバル教育セン...', 'キャリアセンター', '総合情報センター', '情報リサーチ教育研究セ...', '教育開発支援機構', and '教育開発・学習支援セ...'. Below these are links for '情報システム(PC)', '情報システム(SP)', 'ウェブシステム', 'Webシラバス', '法政大学Gmail', and '法政大学公式サイト'. The main content area is titled 'HOPPII' and '大学からのお知らせ/Information'. It features several news items: '【2020年度卒業・修了予定の皆さんへ】' with sub-points about graduation ceremonies and diploma delivery; '【2020年4月入学の皆さんへ】' with sub-points about enrollment; '【2021年度入学生(学部生)の皆さんへ】' with sub-points about enrollment; and '【2021年度の授業実施について】 (3/19更新) 3月22日~31日の入構ルールについて'. A section titled '<新型コロナウイルス感染症に感染した場合(感染の疑いを含む)または濃厚接触者となった場合の対応>' provides instructions for students. Below this is a '各種リンク/Links' section with numerous links for digital books, bulletin boards, network support, login, Zoom, surveys, facilities, Turnitin, GPCA, academic support, student assistant pages, handbooks, peer learning space, research database, certificate applications, academic calendar, regulations, timetables, and course guides. At the bottom, it says 'Powered by Sakai'.

HOPPII は Sakaiベースプラットフォーム

### HOPPII データ

- コース
- 成績表
- シラバス
- 時間割
- SISなど

HOPPIIデータを研究目的で使用することはできませんでした

# Team



Ho



Thuy



Huyen



Hiroshi Ueda


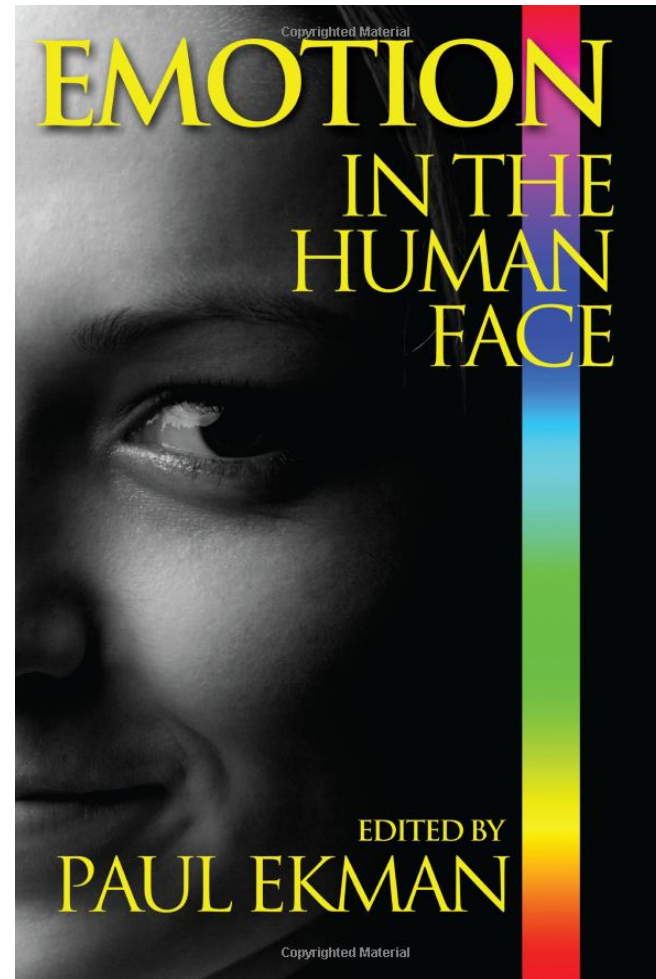
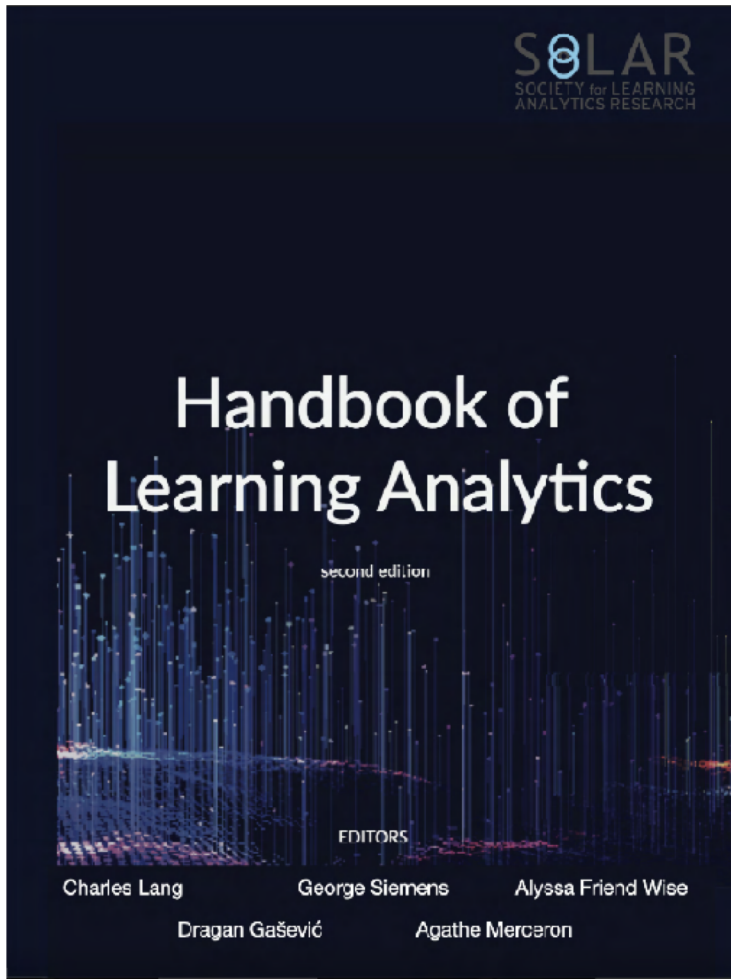


Gokhan

Hacettepe University,  
Turkey

- マルチモーダルデータを研究に活用しよう
  - まずは、エモーションデータからsmall-scaleで研究プロジェクトを立てましょう
  - 目的: Teacher-support システムやClassroomアナリティクスやモニタリングシステムの研究開発を始めた

# なぜ教育研究にエモーションデータ？



Learning and Instruction  
Volume 70, December 2020, 101212

## Emotions are the experiential glue of learning environments in the 21st century

Arthur C. Graesser [✉](#)

Show more [v](#)

[Share](#) [Cite](#)

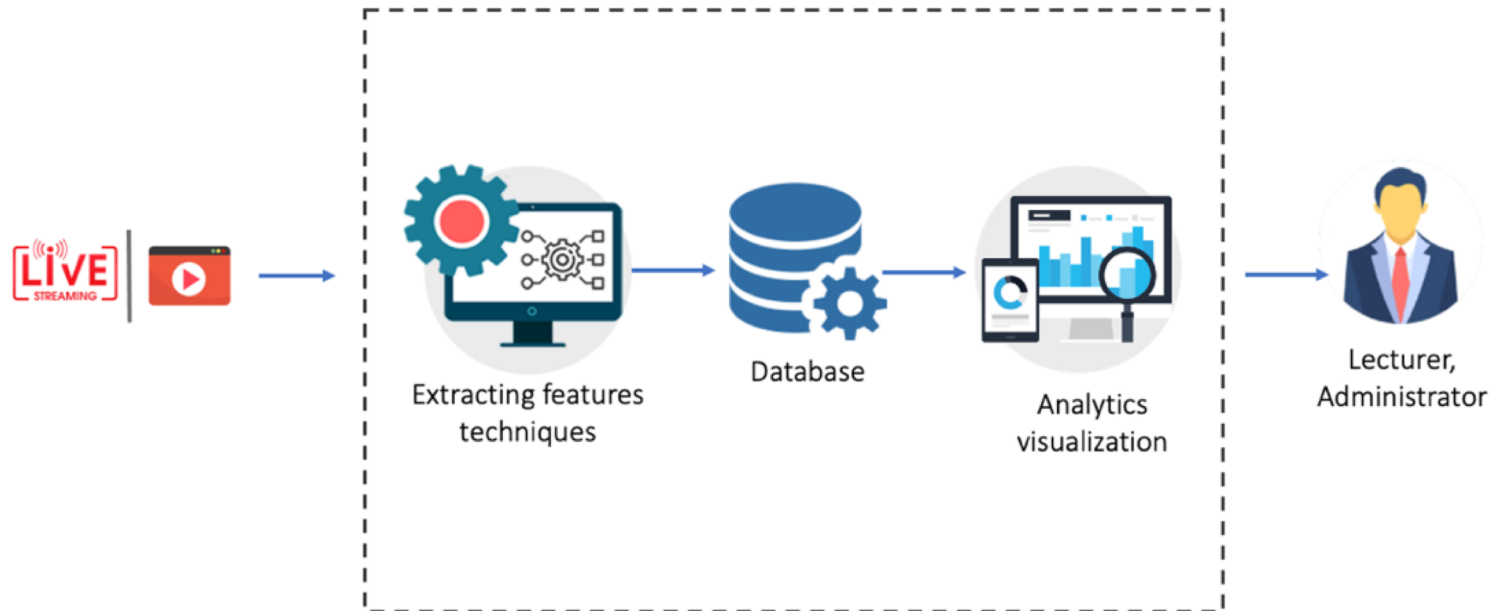
<https://doi.org/10.1016/j.learninstruc.2019.05.009> [Get rights and content >](#)

### Abstract

This article comments on the five papers published in this special issue on *understanding and measuring emotions in technology-rich learning environments*. The articles identify a number of emotions that frequently occur in digital learning environments across different tasks, goals, populations, and subject matters. The Control Value Theory of achievement emotions unifies the research reported in the articles, whereas social emotions surface in contexts where there are significant social interactions, such as group learning or the training of medical students. The emotions that were detected and tracked in the reported studies rely on self-reports of learners and judges who observe them. This commentary identifies a number of limitations of the studies that will hopefully stimulate future research. Researchers are encouraged to collect (1) larger sample sizes, (2) longer interventions with learning technologies, (3) physiological, multimodal, and behavioral signatures of emotions to complement the subjective judgments, (4) more precise timing and transitions between emotions to uncover emotion dynamics, (5) assessments of nonlinear relations between variables, and (6) interventions designed to regulate and productively respond to learner emotions.

# MOEMOシステムのご紹介

- ZoomやWebexビデオを分析して学生のaffective states(感情)やエンゲージメントやコンセントレーションのレベルを予測する



# Realtimeダッシュボード

66%

High Engagement rate



83%

Concentration rate



6

Students

0:14:36

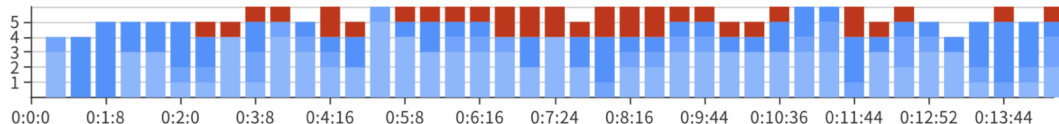
Processing duration

Notification

Nehal is dis-engaging

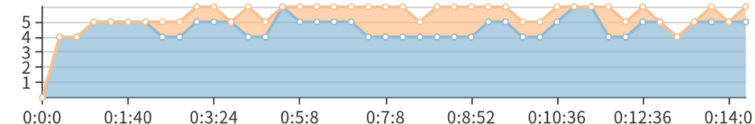
## ENGAGEMENT (Real Time Analytics)

Strong Engagement High Engagement Medium Engagement Low Engagement Disengagement

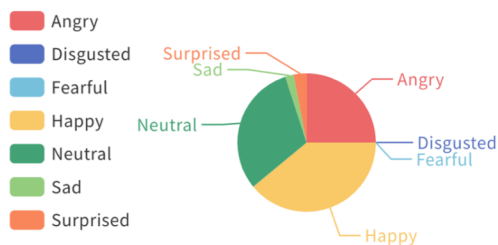


## CONCENTRATION (Real Time Analytics)

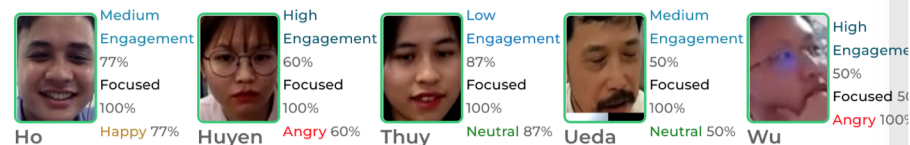
Focused Distracted



## EMOTION DISTRIBUTION (Real Time Analytics)



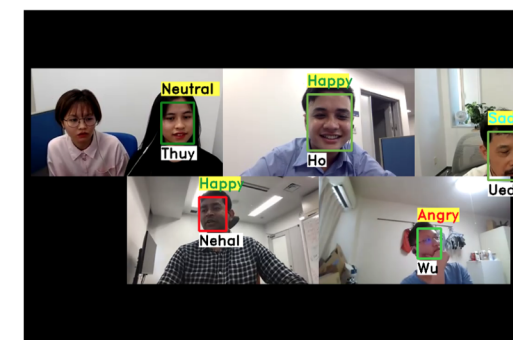
## TOP ENGAGE STUDENTS



## TOP DIS-ENGAGE STUDENTS



## FRAME ANALYSIS



Stop

processing...

Research Center for Computing and Multimedia Studies, Hosei University



# After-class リポートの作成

## SUMMARY REPORT

Date: 2023/02/03 10:43:03

### 1. SUMMARY ANALYSIS

#### Basic Information

##### ACCOUNT

**User** admin  
**Email** nguyentanhoit@gmail.com

##### CLASS INFORMATION

**ID** C101  
**Name** Cross culture study  
**Lecturer** Tiger Zing

##### VIDEO INFORMATION

**Length** 20714  
**FPS** 25  
**Resolution** 1280.0x720.0

##### LOG

**Processing time** every 1 second  
**Analytics time** every 5 seconds

##### BLANK

#### Visualization

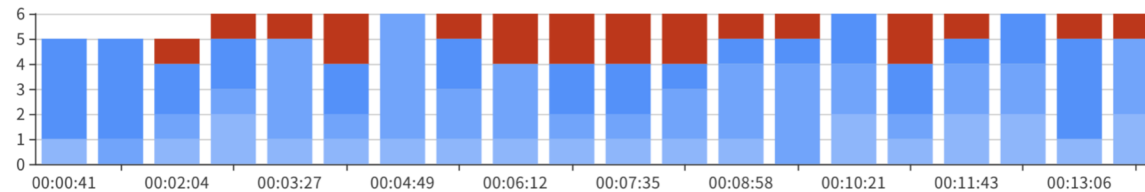
##### ENGAGEMENT RATE

**36%**  
Medium EL

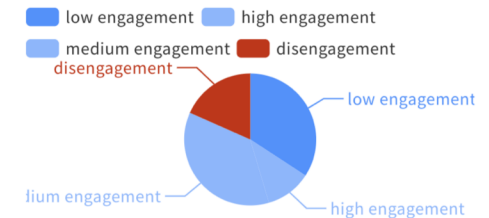
Medium EL 36%  
Low EL 34%  
Non EL 18%  
High EL 11%

##### ENGAGEMENT (time series analysis)

High engagement Medium engagement Low engagement Disengagement



##### ENGAGEMENT (distribution analysis)



##### CONCENTRATION RATE

##### CONCENTRATION (time series analysis)

##### CONCENTRATION (distribution analysis)

# After-class リポートでは

## 2. STUDENT LEARNING ANALYSIS

### STUDENT LIST

ID	Name	
Ho	Ho	<a href="#">More details</a>
Huyen	Huyen	<a href="#">More details</a>
Nehal	Nehal	<a href="#">More details</a>
Thuy	Thuy	<a href="#">More details</a>
Ueda	Ueda	<a href="#">More details</a>
Wu	Wu	<a href="#">More details</a>

### STUDENT PHOTO

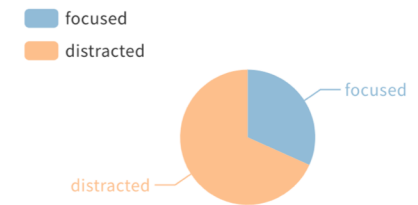


Wu

### ANALYSIS

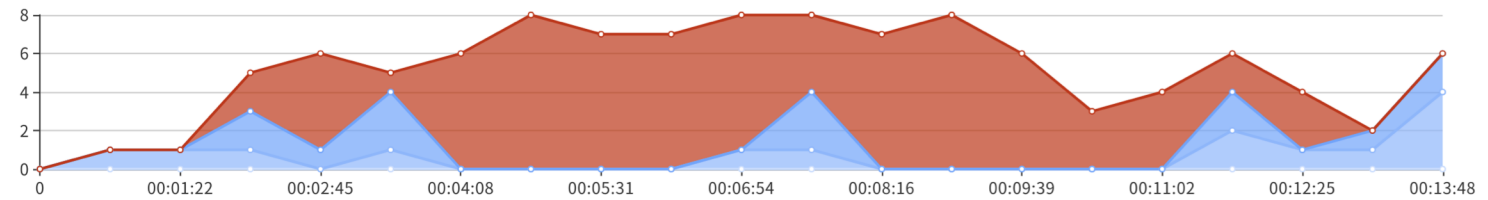
Engagement level	Disengagement (68%)
Emotion type	Happy (50%)
Concentration level	Distracted (68%)
Disengagement interval	00:04:13 --> 00:04:36 00:06:31 --> 00:06:54

### STUDENT CONCENTRATION (distribution analysis)



### STUDENT ENGAGEMENT (time series analysis)

Strong Engagement High Engagement Medium Engagement Low Engagement Disengagement



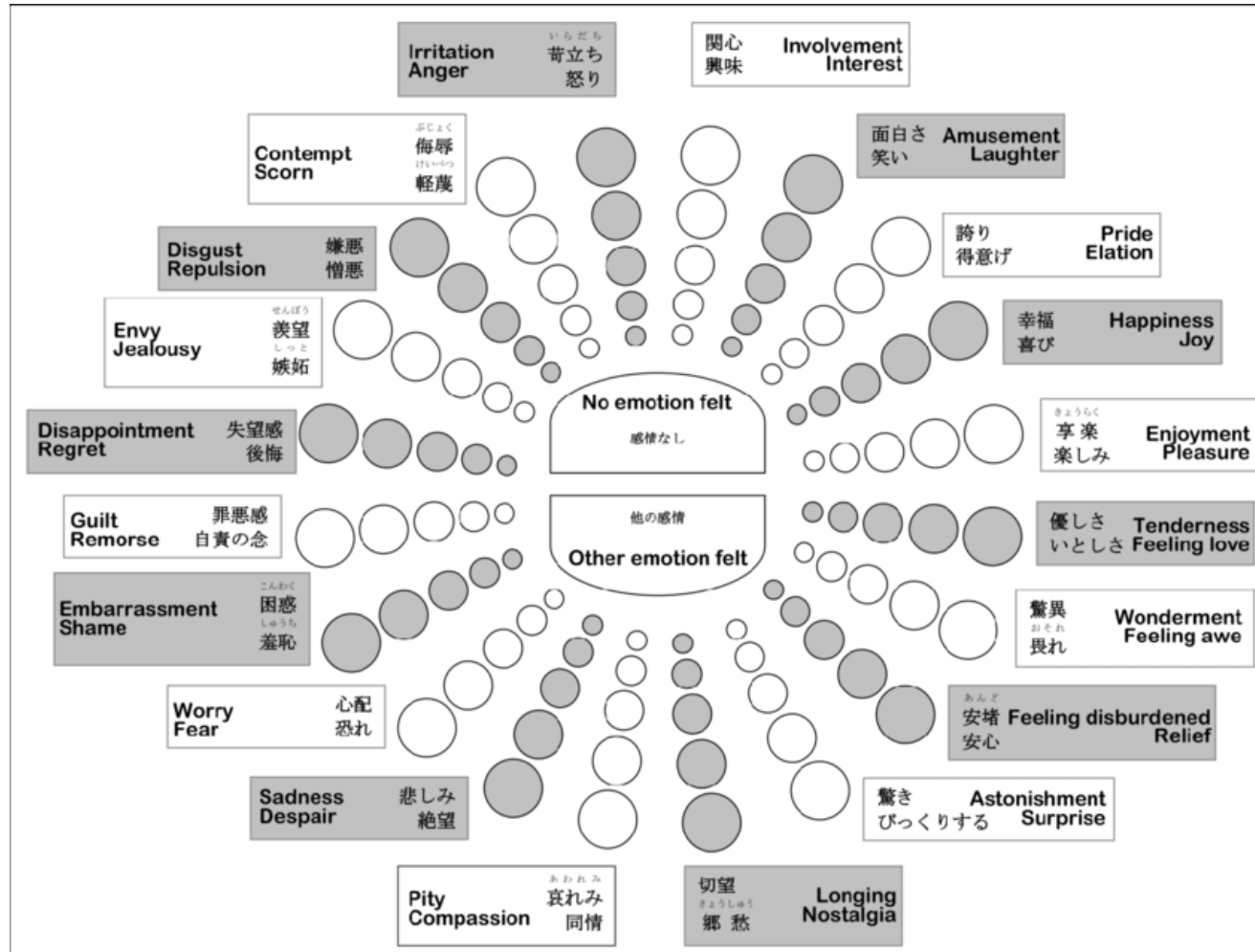
### STUDENT EMOTION (distribution analysis)

### STUDENT EMOTION (time series analysis)

Angry Disgusted Fearful Happy Neutral Sad Surprised



# 評価方法



# まとめ

- MOEMOシステムのメリット
  - リアルタイム ダッシュボード
  - 7種類のaffective states (happy, sad, angryなど)が分かる
  - 5種類のエンゲージメント (highly engaged, low engaged, disengagedなど)が分かる
  - 2種類のコンセントレーション (focusedかdistracted)が分かる
  - 学生のクラスターが分かる
  - After-classレポートの作成すること
- チャレンジ
  - エモーションデータの信頼性
  - Camera-offの時