

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)

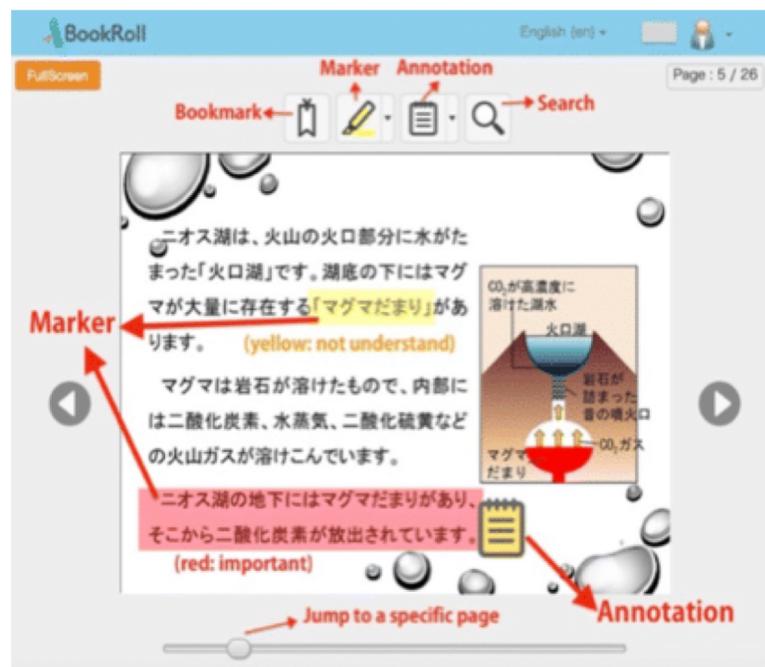


Learning analytics研究では

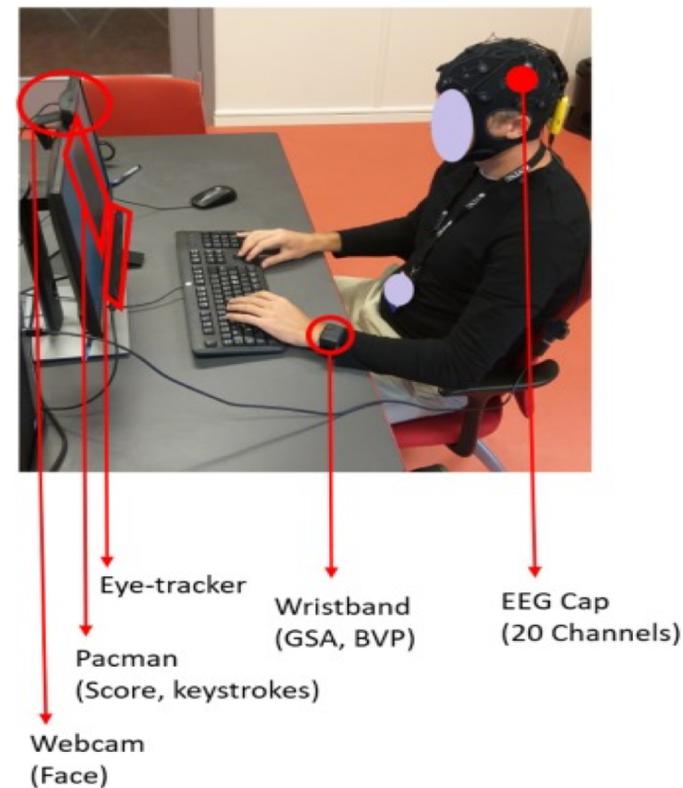
LMSデータ



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ン...', '教育開発支援機構', and '教育開発・学習支援...'. The main content area is titled 'HOPPII' and '大学からのお知らせ/Information'. It features several news items, including announcements for graduates, new students, and faculty, as well as information regarding COVID-19 safety protocols. A '各種リンク/Links' section on the right provides quick access to various university services and resources.

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

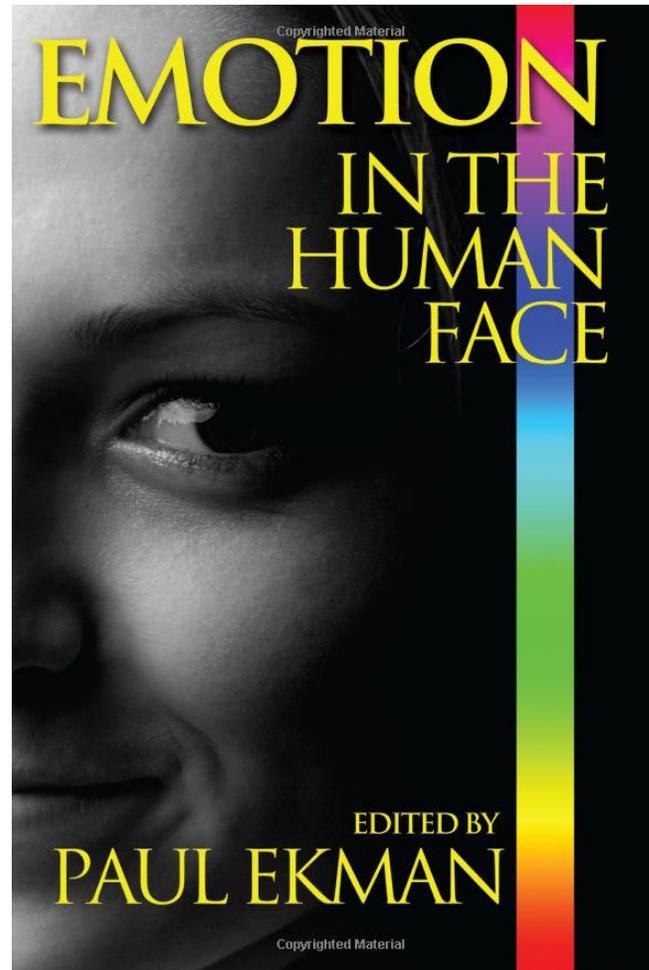
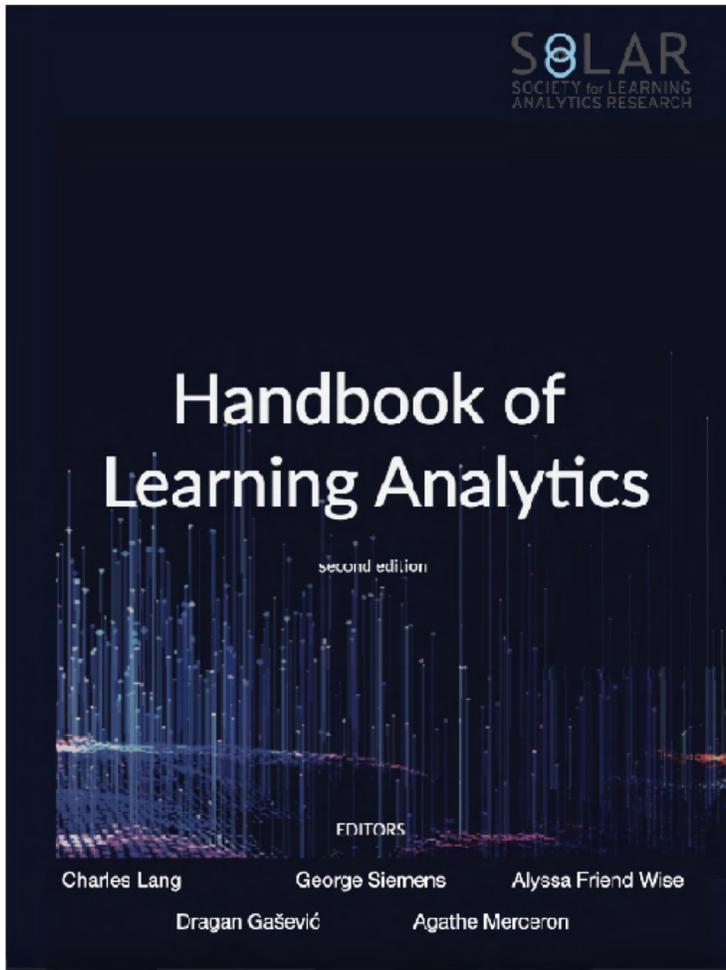


Gokhan

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 ▾

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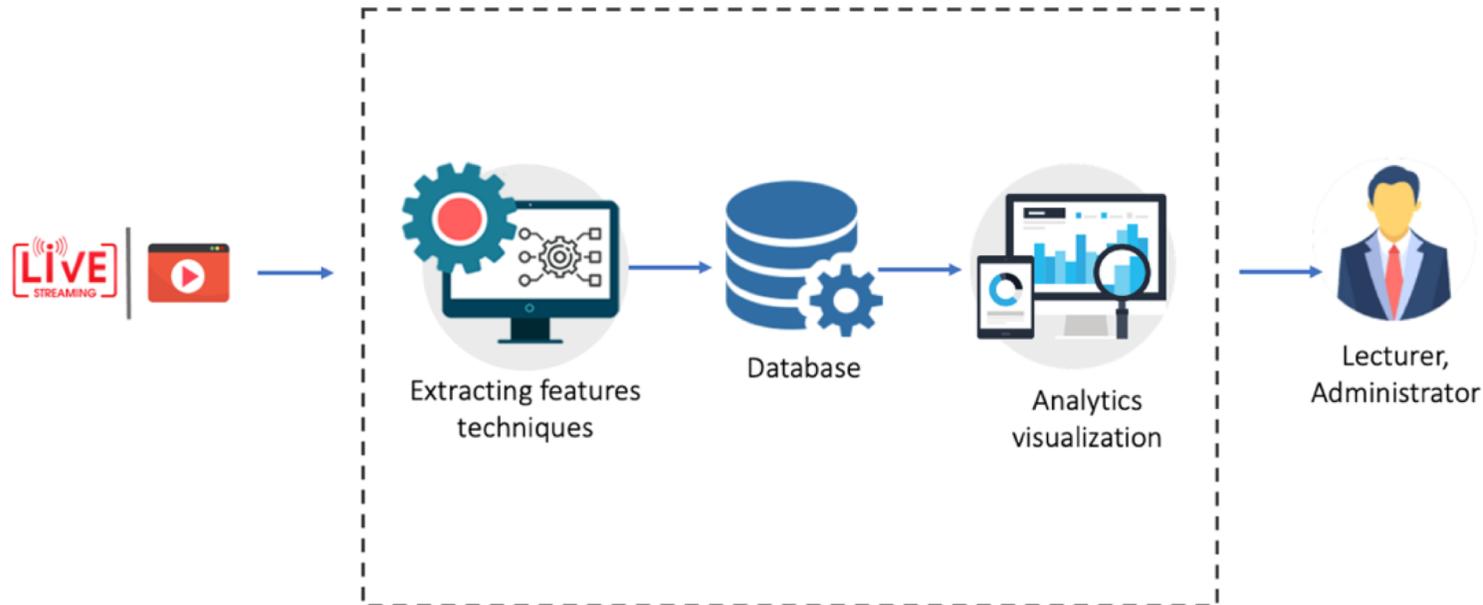
<https://doi.org/10.1016/j.learninstruc.2019.05.009> [Get rights and content](#) ➤

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

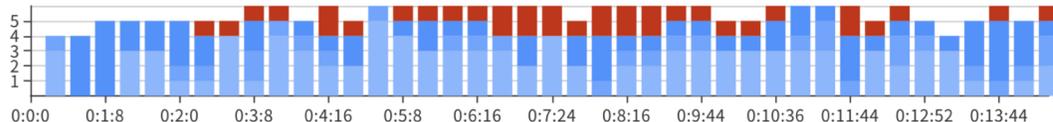
Processing duration

Notification

Nehal is dis-engaging

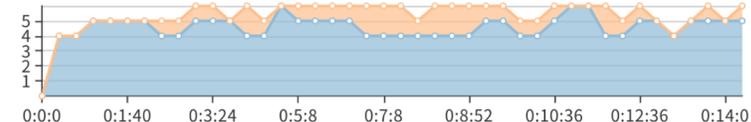
ENGAGEMENT (Real Time Analytics)

Strong Engagement High Engagement Medium Engagement Low Engagement Disengagement

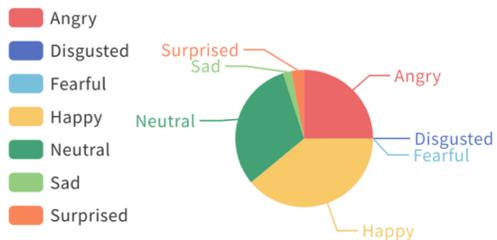


CONCENTRATION (Real Time Analytics)

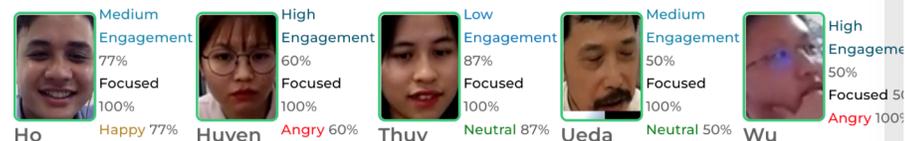
Focused Distracted



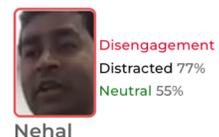
EMOTION DISTRIBUTION (Real Time Analytics)



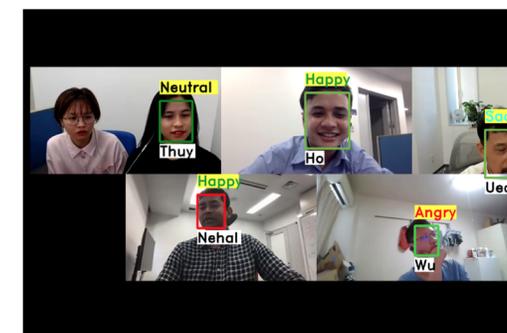
TOP ENGAGE STUDENTS



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

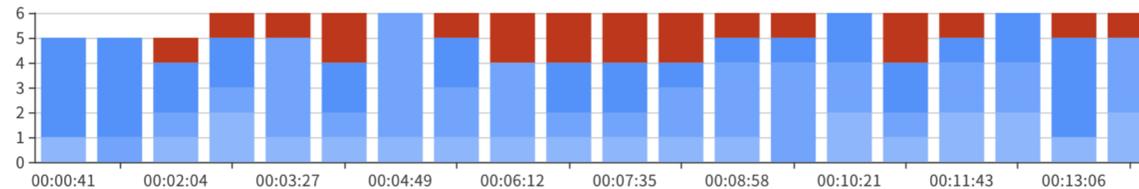
ENGAGEMENT RATE

36%
Medium EL

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

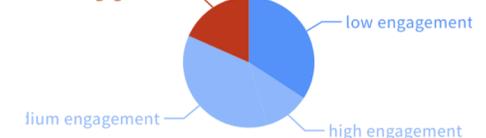
ENGAGEMENT (time series analysis)

High engagement Medium engagement Low engagement Disengagement



ENGAGEMENT (distribution analysis)

low engagement high engagement
medium engagement disengagement



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	More details
Huyen	Huyen	More details
Nehal	Nehal	More details
Thuy	Thuy	More details
Ueda	Ueda	More details
Wu	Wu	More details

STUDENT PHOTO



Wu

ANALYSIS

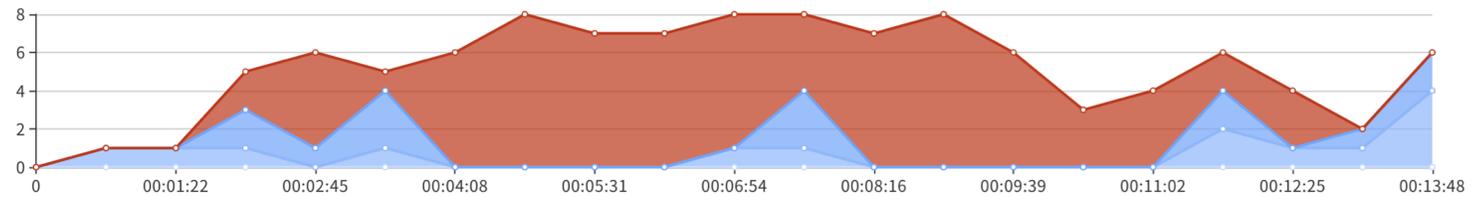
Engagement level	Disengagement (68%)
Emotion type	Happy (50%)
Concentration level	Distracted (68%)
Disengagement interval	00:04:13 --> 00:04:36 00:06:31 --> 00:06:54

STUDENT CONCENTRATION (distribution analysis)



STUDENT ENGAGEMENT (time series analysis)

Strong Engagement High Engagement Medium Engagement Low Engagement Disengagement



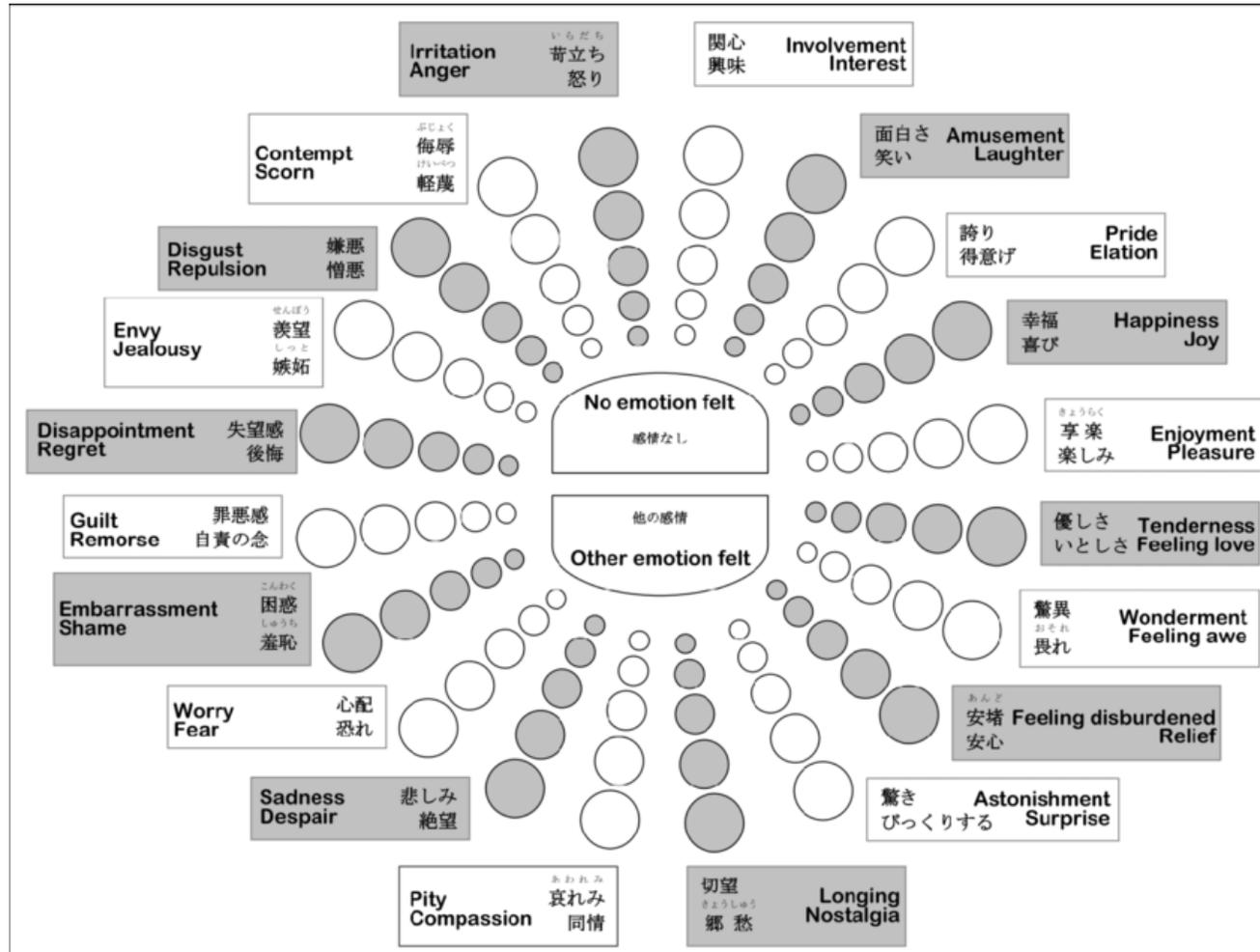
STUDENT EMOTION (distribution analysis)

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