

様式 A-1
(FY2024)

2024 年 7 月 12 日

サイエンス・ダイアログ 実施報告書

1. 学校名・実施責任者氏名: 東京都立科学技術高校
2. 講師氏名: Dr. Fang Wang
3. 講義補助者氏名: 下馬場 朋禄
4. 実施日時: 2024 年 7 月 4 日 (金) 14 : 00 ~ 15 : 00
5. 参加生徒: 1 年生 70 人、 2 年生 10 人、 3 年生 10 人 (合計 90 人)
備考: 創造理数科と科学技術科の生徒
6. 講義題目: ホログラフィ
7. 講義概要: ホログラフィを用いた3D ディスプレイ全般について
8. 講義形式:
☒対面 ・ ☐オンライン (どちらか選択ください。)
 - 1) 講義時間 60 分 質疑応答時間 10 分
 - 2) 講義方法 (例: プロジェクター使用による講義、実験・実習の有無など)
プロジェクター使用による講義
 - 3) 事前学習
☒有
使用教材 講師提案のキーワードを事前に配布
9. その他特筆すべき事項:

Form B-2
(FY2024)
Must be typed

Date (日付)
5/7/2024 (Date/Month/Year: 日/月/年)

Activity Report -Science Dialogue Program-
(サイエンス・ダイアログ 実施報告書)

- Fellow's name (講師氏名): Fan Wang (ID No. P23378)

- Name and title of the lecture assistant (講義補助者の職・氏名)
Prof. Tomoyoshi Shimobaba

- Participating school (学校名): Chiba University

- Date (実施日時): 4/7/2024 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目):
Real 3D display using holographic technique

- Lecture format (講義形式):
◆ ☒ Onsite ・ ☐ Online (Please choose one.)(対面 ・ オンライン)((どちらか選択ください。))
◆ Lecture time (講義時間) 45 min (分), Q&A time (質疑応答時間) 15 min (分)
◆ Lecture style(ex.: used projector, conducted experiments)
(講義方法 (例: プロジェクター使用による講義、実験・実習の有無など))
プロジェクター使用による講義、展示品を見せた

- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

I made a presentation with 5 sections as below:

- 1, What is the 3D display?
- 2, Categories of 3D display?
- 3, Properties of holographic 3D display.
- 4, Problems in holography technology.
- 5, Applications of holographic display: AR glasses

In summary, my presentation first showed the difference between two-dimensional(2D) information and three-dimensional(3D) information, and explained why our eyes can generate a 3D perception when watching real-world, but only 2D perception when watching medium like TV, screen etc. Next, based on the principle that the human eye perceives three-dimensional objects, I introduced multiple parallax-based 3D displays techniques and talked about the difference between their theory. Then, I introduced the holographic technique and explained how different from the previous parallax-based 3D displays techniques. And, I exhibited to them some optical

holograms, which were recorded by chemistry material. But the optical holograms are fixed 3D images that cannot display dynamically, therefore, we aim to develop computer-generated holograms(CGH) that can provide a dynamic generation of holograms, and then display in the electronic device. CGH technique is expected to be the best 3D display method suitable for human eyes, but there are still some challenges for display with good quality and high-speed refresh. So, my research work is to develop algorithms and build optical setup to implement holographic 3D display. Finally, I introduced some applications of holographic 3D display. The wearable devices, like augmented reality(AR), mixed reality(MR), are the next generation interaction way, and 3D display is an important part of this technique.

◆Other noteworthy information (その他特筆すべき事項):

None

- Impressions and comments from the lecture assistant (講義補助者の方から、本プログラムに対する意見・感想等がありましたら、お願いいたします。):

My accompanying, Prof. Shimobaba commented that the students were very active and motivated, and that they were good at imagining some of the sci-fi problems, which is very important for scientific exploration.