An Object-Based Refocusing Scheme for Light Field Video Content

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Presented by:

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Research

- Light Field (LF) Compression
- LF Refocusing
- LF Quality Metrics
- LF view synthesis

Work

- Research Assistant; DML
- Teaching Assistant; UBC
- Lecturer; DU; BRAC U

Education

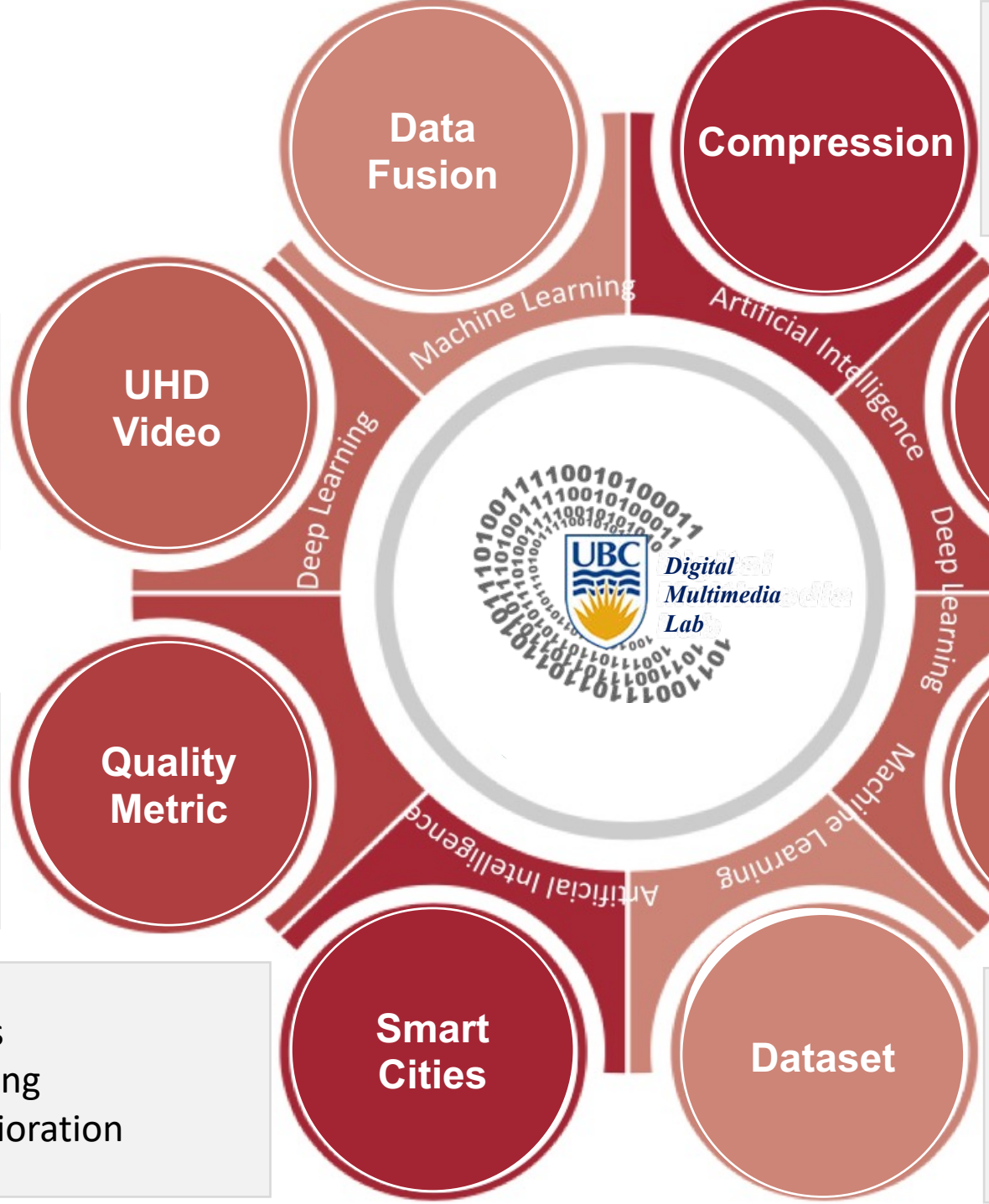
- Ph.D. 2018-present; UBC
- M.S. 2013-2015; DU
- B.Sc. 2009-2013; DU

Skills

- Deep Learning
- UI design and front-end development
- Software development

Interests

- Internet
- Movies
- Travelling
- Cooking



- 8K
- 4K
- Light Field
- Immersive video

- 4K, 8K, LF capture
- Calibration
- Rendering

- Tone Mapping
- Inverse Tone Mapping

- DL based video quality
- LF spatial and angular quality

- Fall Detection
- Medical Image processin

- Street Signs
- Street Parking
- Road Deterioration

- 4K and 8K pairs
- 2K and MOS pairs
- Light field

Traditional Light Field Refocusing can only refocus on different depth planes

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Refocusing looks even more inconsistent when same object spans over multiple depth planes

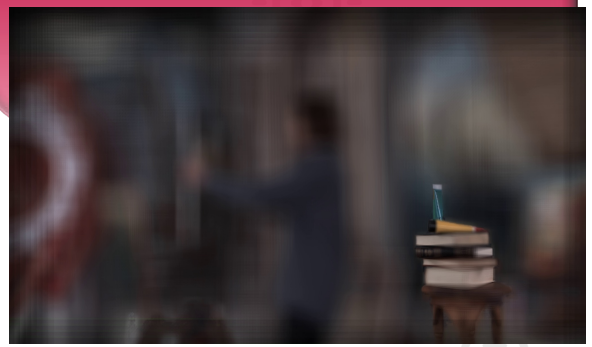
Human vision focuses on objects in real world

Our Objective:
Bring Light Field refocusing closer to human perception

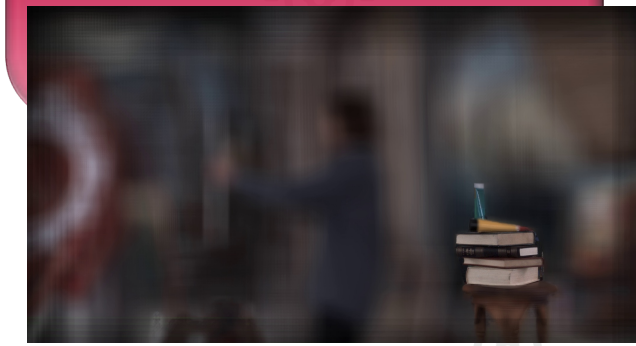
User clicks on a pixel – pixel belonging to the OBJECT comes in focus

Object Segmentation

Refocusing



Enhancement



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PAR UNE PARFONDE
GAUDINE.

Object Segmentation of LF video

- COCO annotator 1 fps
- Detectron2 29 fps

Annotated

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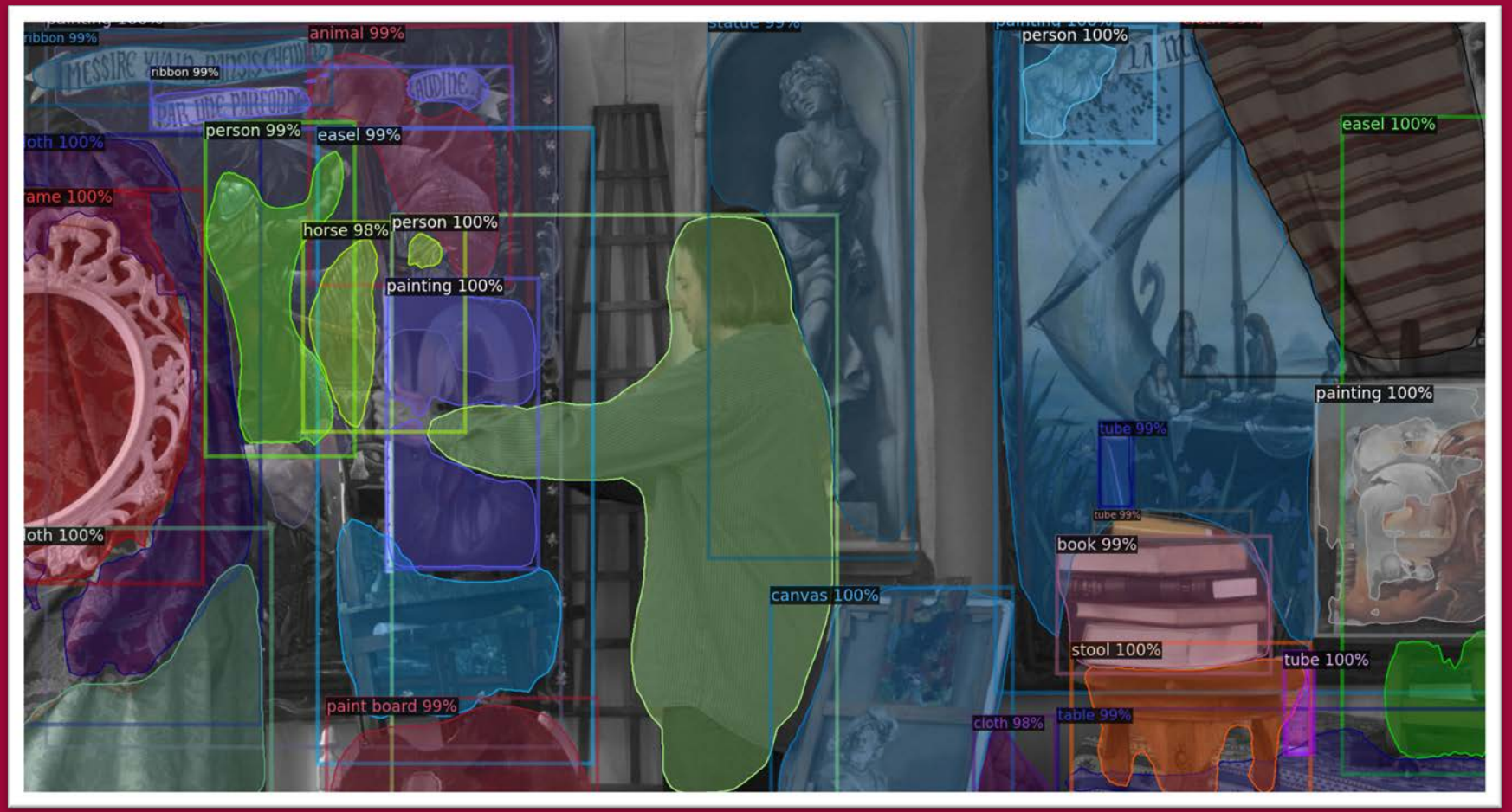
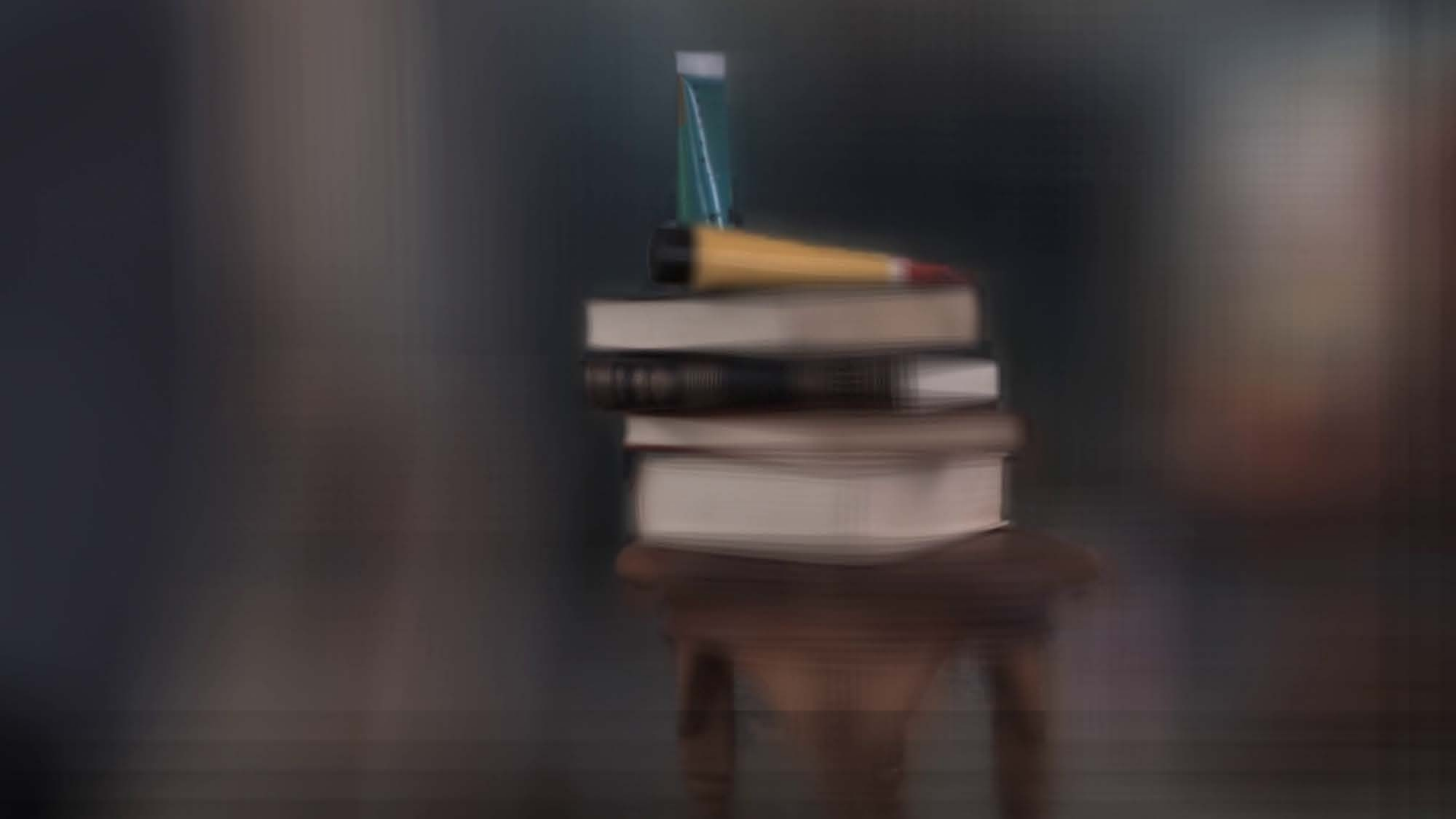
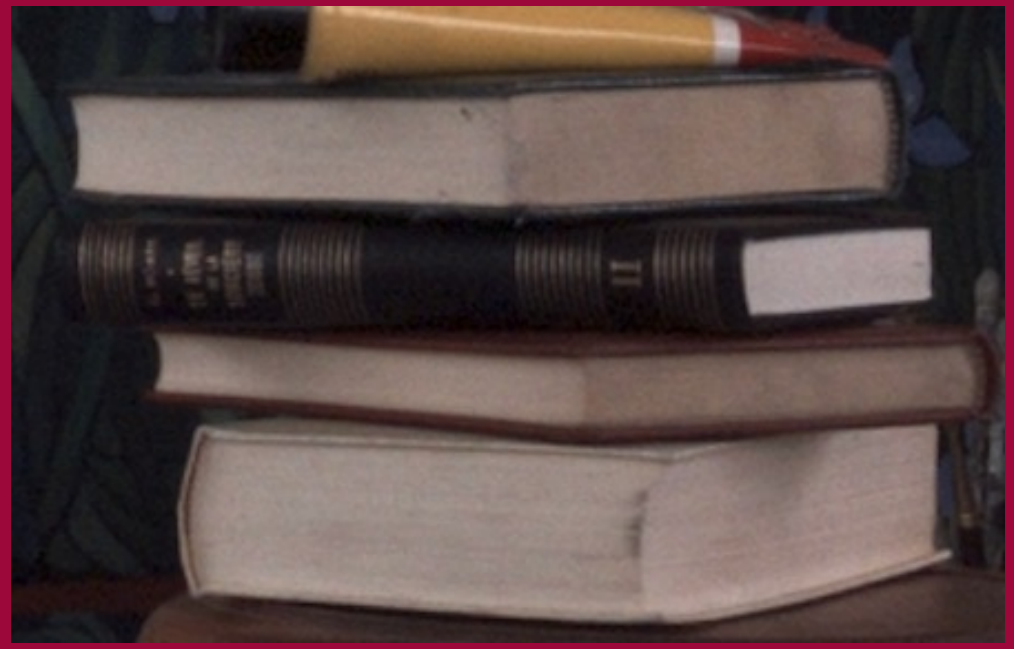


Inferred

Refocusing on the “books”

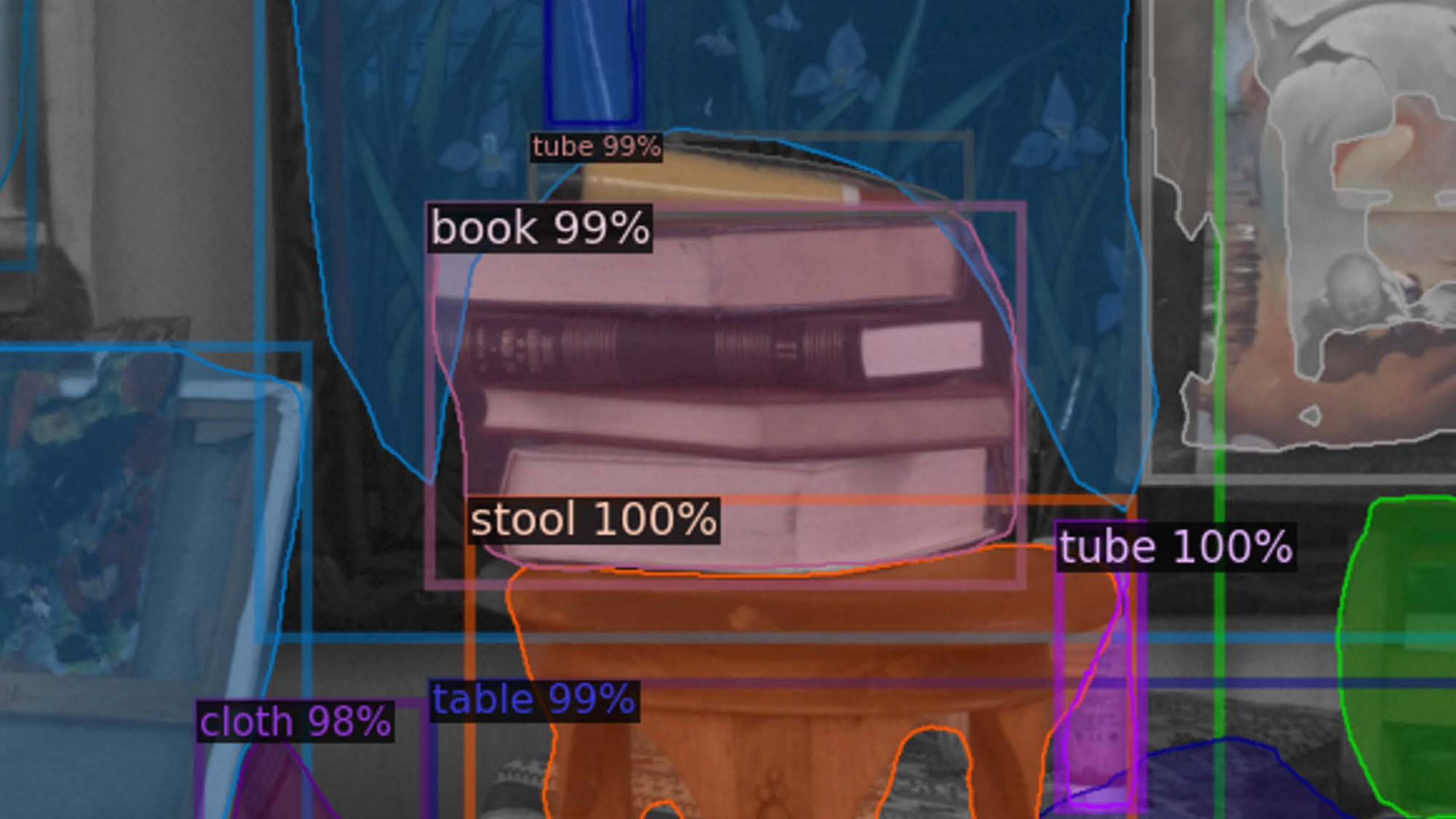


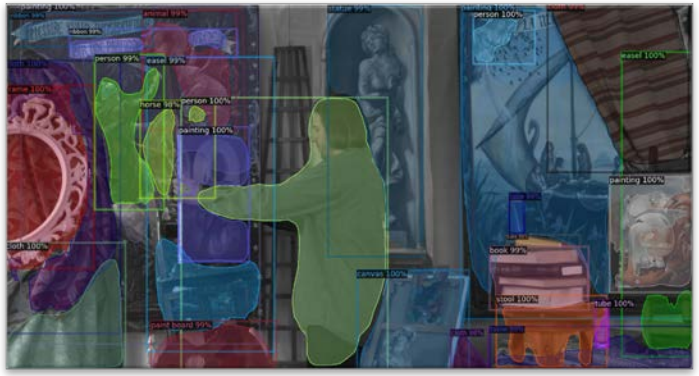
Refocused

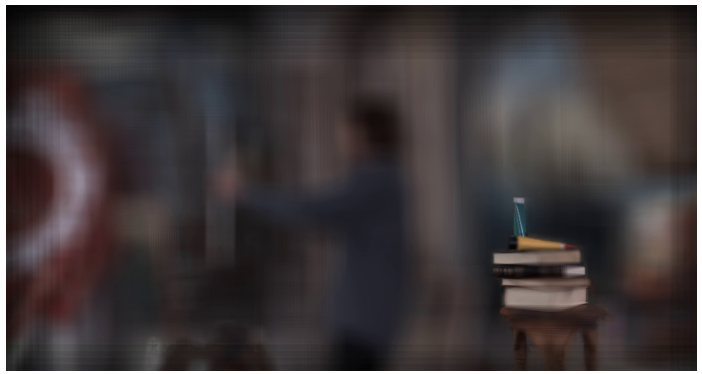


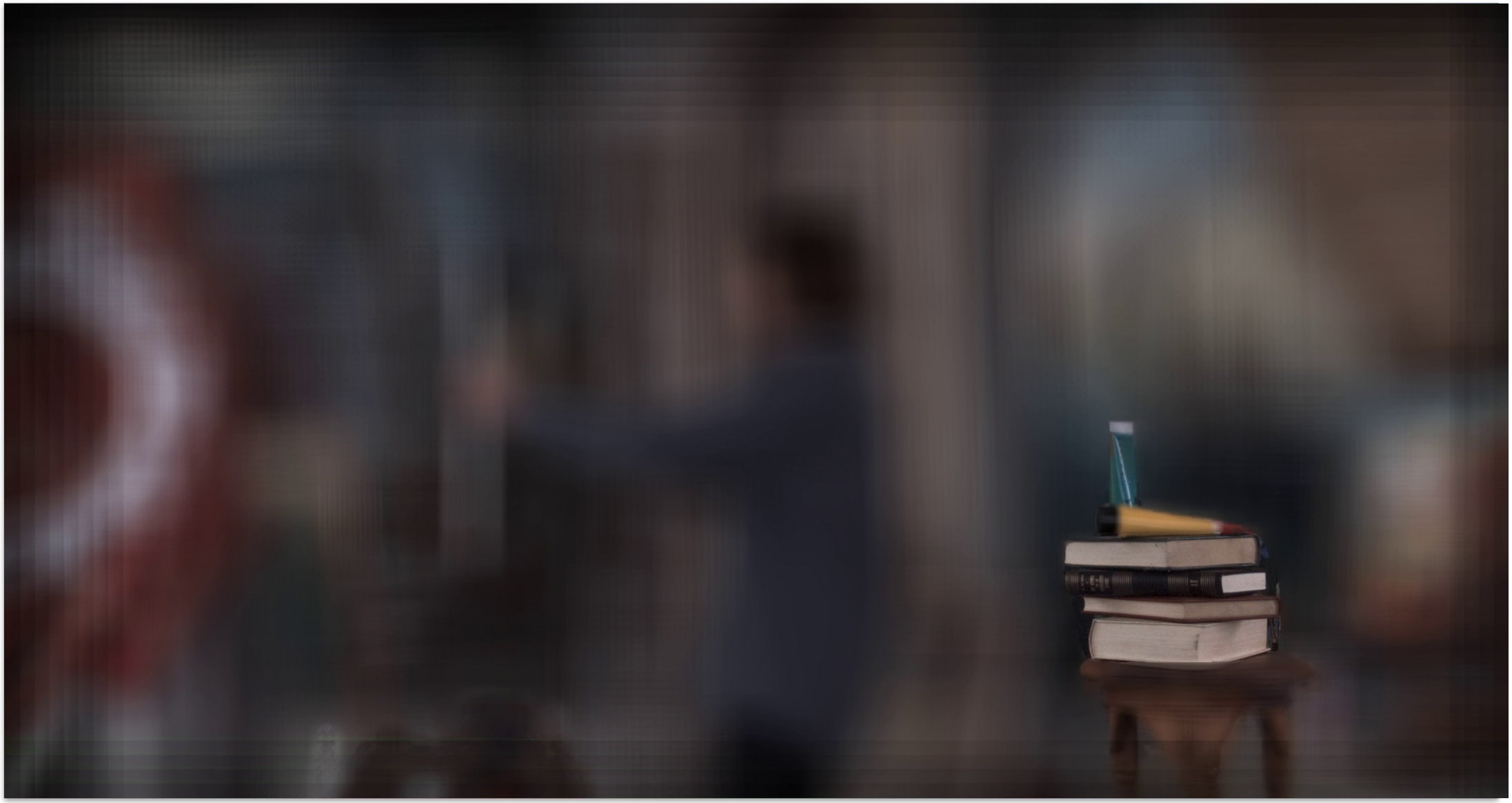
Original

painting 100%
ribbon 99%
animal 99%
ribbon 99%
statue 99%
painting 100%
person 100%
cloth 99%
easel 100%
cloth 100%
person 99%
easel 99%
frame 100%
horse 98%
person 100%
painting 100%
painting 100%
tube 99%
tube 99%
cloth 100%
book 99%
canvas 100%
stool 100%
tube 100%
paint board 99%
cloth 98%
table 99%


tube 99%
book 99%
stool 100%
tube 100%
table 99%
cloth 98%


person 100%
easel 100%
person 99%
easel 99%
person 100%
painting 100%
painting 100%
book 99%
stool 100%
tube 100%
sloth 100%
canvas 100%
paint board 99%





Refocused

Original

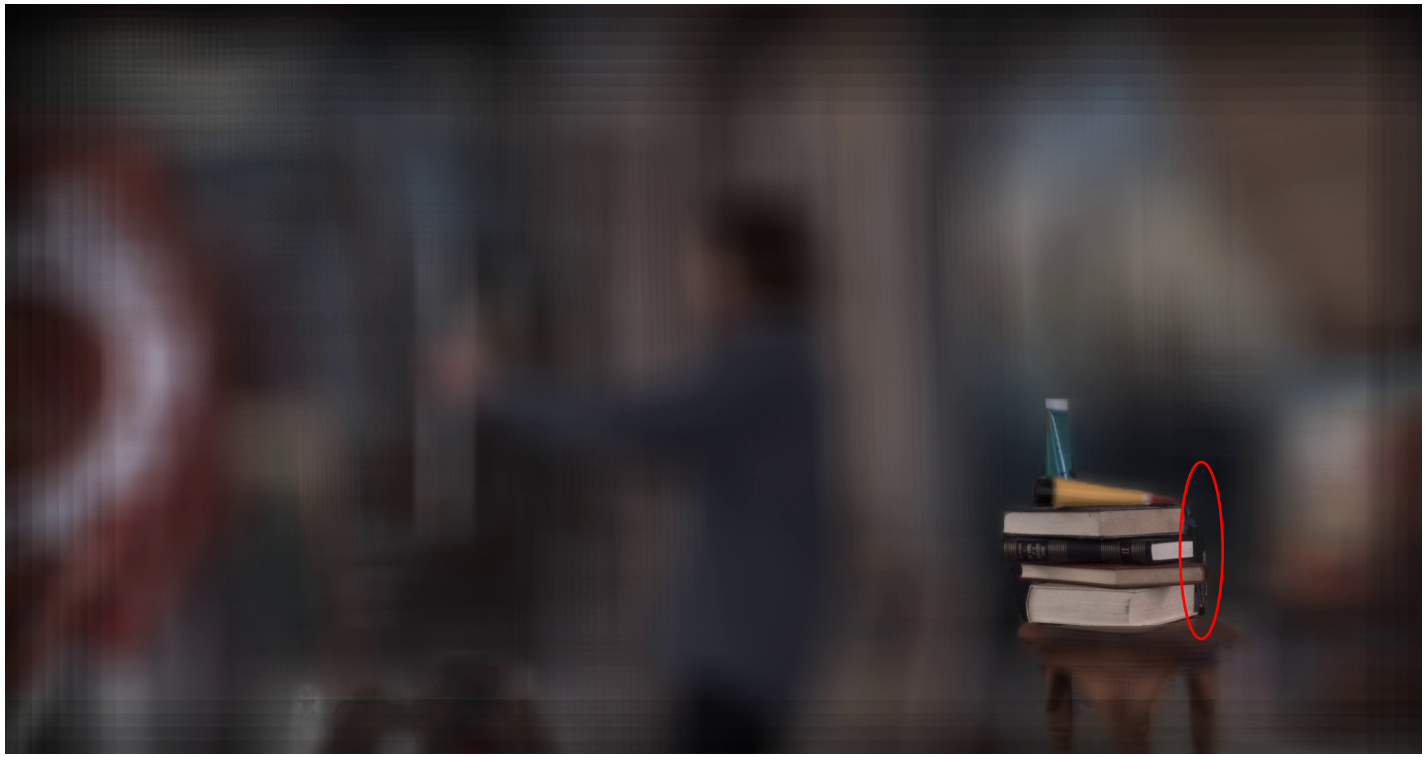
Enhanced Refocusing

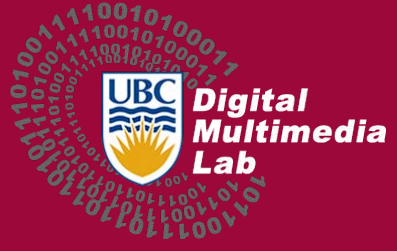
Conclusion

- We developed a new LF LF refocusing system
- It is more consistent with human perception compared to existing state-of-the-art solutions

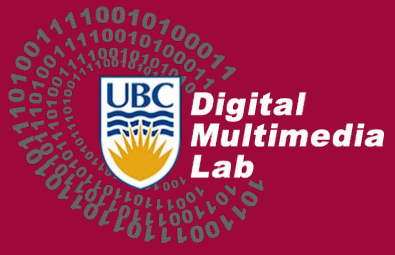
Confusion near the edge of refocused object

- Better labelling
- More training with extend dataset
- Blending





Thank You



Questions