

My 10-Year Journey in 3D Vision

And Finding Our Poses in the Current World

Songyou Peng

3DV 2026 Award Talk

Story 1: How I Started 3D Vision

Background: I was a student in a European masters program; looking for the a summer internship for 2016



I cold emailed
Peter Sturm



@ Girona, 2016

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Worked on Camera
Calibration in Summer 2016
@ INRIA Grenoble



Master thesis w/ Daniel Cremers
@ TUM



PhD w/ Marc Pollefeys &
Andreas Geiger in 2019
@ ETH & MPI

Story 1: Lessons Learned

People: Some people can change your life entirely

Luck: You need a lot of lucks to have a chance to work with the right mentors and advisors



Story 2: First Paper During PhD

Background: Traveled weekly from Zürich to Tübingen for in-person chat, submitted Convolutional Occupancy Networks

ECCV reviews out Inbox x MPI x



Andreas Geiger <andreas.geiger@tue.mpg.de>

to me, Lars, Michael ▾

📧 Sat, 23 May 2020, 12:34



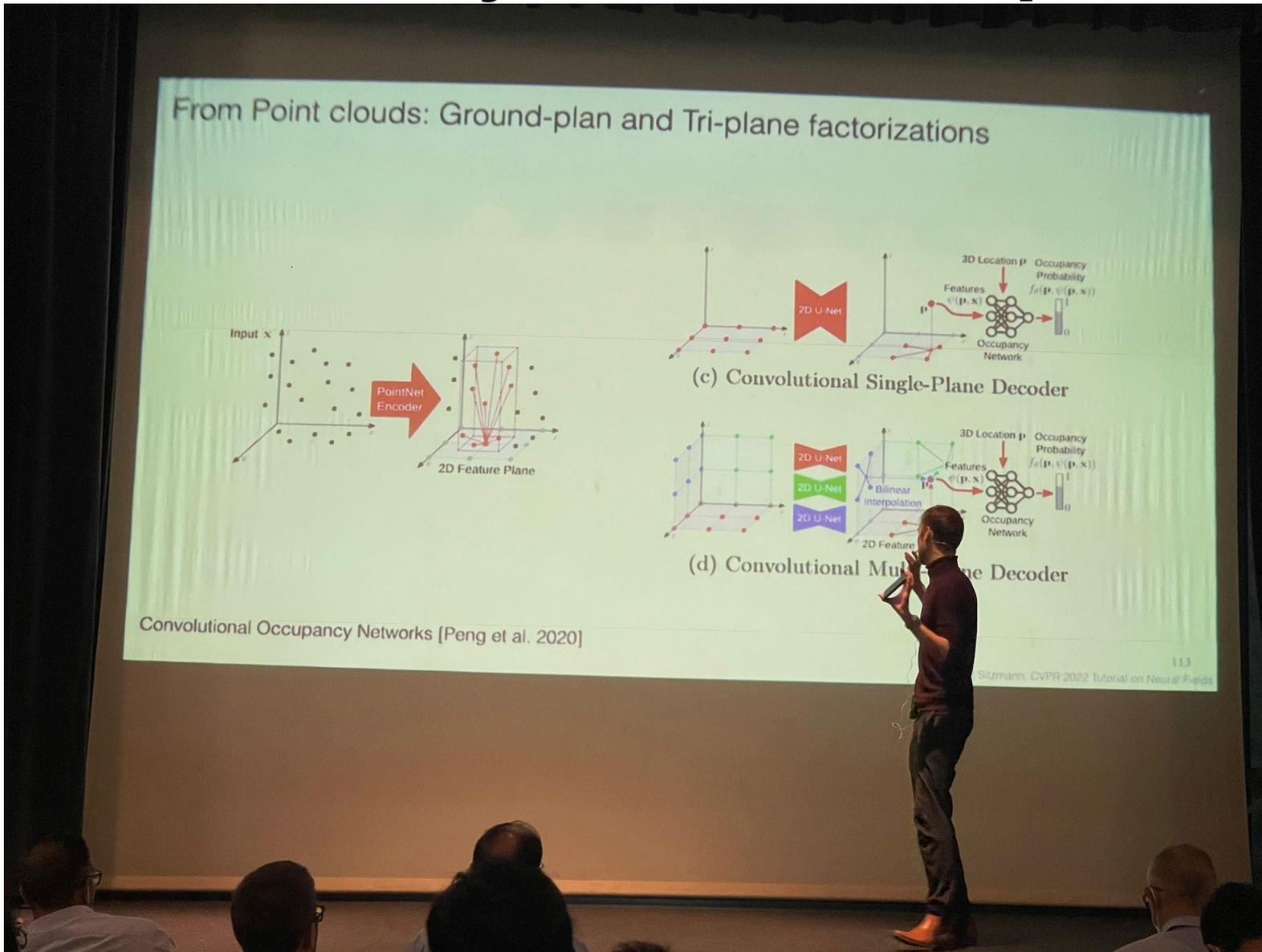
There is a chance that we can get this in, however, none of the reviewers gave weak accept, all are kind of borderline, so we need to work on this rebuttal well. papers with 3 borderlines often do not get in as there is no "champion"

- “Other works have better numbers... the task is not novel...”
- “The comparison is not fair...”
- “What is the point of having that **3-plane** representation?”
-

Story 2: First Paper During PhD

- Worked hard to rebut → 3 WA → ECCV'20 spotlight
- This paper has 1300+ citations now
- Inspired many follow-ups (especially using our **Tri-plane**)

Story 2: First Paper During PhD



"It is a really good paper. I encourage all of you to read it."

– Prof. Vincent Sitzmann @ ICVSS 2022

Story 2: Lessons Learned

People: You should seek any chance to collaborate with the most brilliant minds, like Michael Niemeyer (congrats!!!)

Luck: We got reasonable reviewers; Tri-planes got so much more popular than we thought; Right timing...etc

Grit: Don't give up, keep fighting

Story 3: Second Paper, and...



- Brainstormed with Max Jiang who I met at CVPR'20, online
- Did not work after 4 months, I **gave up**...temporarily
- Instead, went to help out **two colleagues' ICCV submissions**
- Then, revisited my our own paper, made it work, submitted...

Shape As Points A Differentiable Poisson Solver

NeurIPS 2021 (Oral)

Songyou Peng^{1,2} Chiyu "Max" Jiang Yiyi Liao^{2,3} Michael Niemeyer^{2,3}
Marc Pollefeys^{1,4} Andreas Geiger^{2,3}

¹ETH Zurich ²Max Planck Institute for Intelligent Systems ³University of Tübingen ⁴Microsoft

Story 3: Lessons Learned

People: Your best collaborator might come from anywhere

Luck: those 2 papers I helped out both had 1000+ citations

Grit: worked with Max remotely, met every Sunday evening

It might be better to just give up, sometimes 😊

Story 4: The Art of Giving Up

- We submitted a paper to SIGGRAPH, got rejected
- We submitted it to SIGGRAPH Asia, got rejected again
- We submitted it to 3DV'24

Thank you 3DV



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THE ELEPHANT IN THE ROOM

(The Anxiety of the Sidelined 3D Vision Researcher)



THE ELEPHANT IN THE ROOM

(The Anxiety of 3D Vision researchers)

3D VISION: Sidelined?

PHD JOB MARKET CONCERNS

GRANT SUBMISSION FORM - 3D RESEARCH: Sustaining 3D Vision

VIDEO GEN

LLM

LLM

GENERATED VIDEO

THE WALL OF GENERATION MODELS

2D & VIDEO FUNDING: BILLIONS

GRANT FUNDING: Sustaining 3D vs. The 2D Wall

3D VS VIDEO GEN: The job market

3D Vision: Declining Future?

The 3D Sidelined: Reclaiming Future

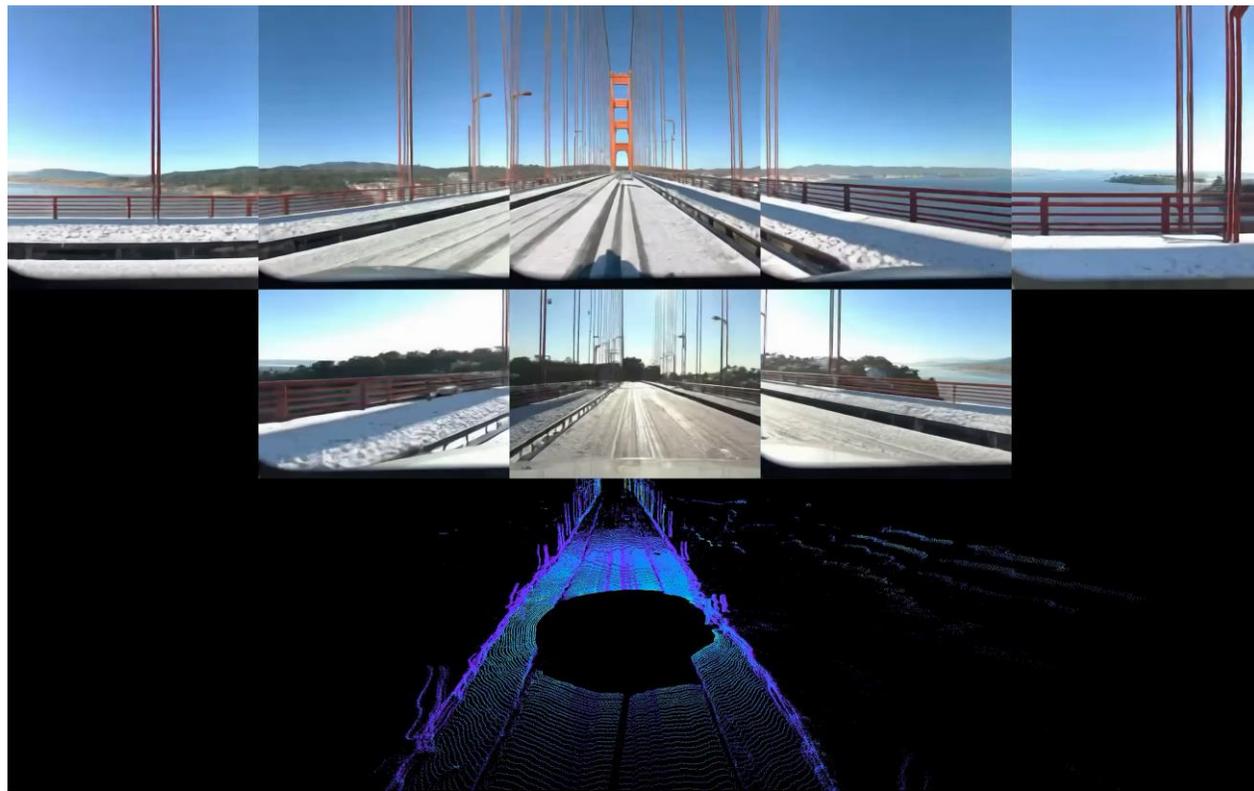
We Need Mindset Shift in the Short Term

✗ “How do we make the industry care about 3D tasks again?”

✓ “How can 3D make those foundation models better?”



MLLMs suffer from 3D spatial reasoning



World models should also benefit from 3D

Our World is 3D in Principle

- 3D will never die; it might be evolving into the invisible backbone of the next-gen of AI
- We need a paradigm shift for 3D vision, just like LLM
- Think harder, think bigger

The future of 3D vision is on OUR hands

THANK YOU



Marc Pollefeys



Andreas Geiger



Peter Sturm



Michael Niemeyer



Lars Mescheder



Chiyu "Max" Jiang



Yiyi Liao



Zihan Zhu



Tom Funkhouser



Kyle Genova



Michael Oechsle



Christian Reiser



Daniel Cremers



Yvain Queau



Bjoern Haefner



Zhaopeng Cui



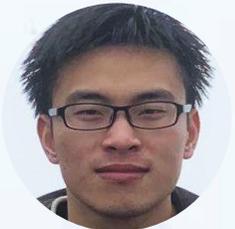
Shaohui Liu



Viktor Larsson



Martin R. Oswald



Zehao Yu



Torsten Sattler



Andrea Tagliasacchi



Gordon Wetzstein



Shengqu Cai

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