



## *Countering Bias in Computer Graphics Research (The BOF!): One Year Later*

Theodore Kim and Holly Rushmeier, Yale University  
Raqi Syed, Victoria University of Wellington  
Wojciech Jarosz, Dartmouth College  
Derek Nowrouzezahrai, McGill University  
James Malazita, Rensselaer Polytechnic Institute

SIGGRAPH Birds of a Feather, August 8, 2022

Good evening everybody, thanks for coming to this Birds of a Feather, “Countering Racial Bias in Computer Graphics Research (the BOF): One Year Later”.

I’m Ted Kim, a professor at Yale University, and I’m organizing this with Professors Holly Rushmeier, Raqī Syed, Wojciech Jarosz, Derek Nowrouzezahrai, and James Malazita.

This is a sequel to the BOF from last year, “Countering Racial Bias in Computer Graphics Research Requires Structural Change.”

## Schedule

- Intro. and Summary - Prof. Kim (5 min)
- DEI in VFX Pedagogy - Prof. Syed (10 min)
- STS and Rendering – Prof. Malazita (10 min)
- Next Steps – Prof. Kim (5 min)
- Open Discussion (60 min)

I know we have a diverse, heterogeneous audience out there, so I'm going to give a brief summary of what we covered last year, the goals we set out, and then talk about how we did this year.

I'm then going to hand the mic to Professor Syed from Victoria University Wellington, who is going to talk about some of the anti-racist content she is covering at the Educator's Forum this year, and then to Professor Malazita, who will talk about the anti-racist content he is presenting at the SIGGRAPH Talks forum this year.

Then I'll wrap up with some suggestions for SIGGRAPH 2023.

I estimate that this scripted portion of the BOF will only last about half an hour. After that, we will get to the most important part, an open discussion among you all. There is about an hour allocated for that, and if people want to stay even later, we can adjourn to a different Zoom room.

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- Open Discussion (60 min)

Okay, let's get started. A quick recap of last year.

## Countering Racial Bias in Computer Graphics Research

Theodore Kim  
Holly Rushmeier  
Julie Dorsey  
Yale University

Derek  
Nowrouzezahrai  
McGill University

Raqi Syed  
Victoria University of  
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Dartmouth College

A.M. Darke  
University of  
California, Santa  
Cruz

### ABSTRACT

Current computer graphics research practices contain racial biases that have resulted in investigations into "skin" and "hair" that focus on the hegemonic visual features of Europeans and East Asians. To broaden our research horizons to encompass all of humanity, we propose a variety of improvements to quantitative measures and qualitative practices, and pose novel, open research problems.

### ACM Reference Format:

Theodore Kim, Holly Rushmeier, Julie Dorsey, Derek Nowrouzezahrai, Raqi Syed, Wojciech Jarosz, and A.M. Darke. 2021. Countering Racial Bias in Computer Graphics Research. In *Proceedings of Under Review*. ACM, New York, NY, USA, 2 pages. <https://doi.org/10.1145/1122445.1122456>

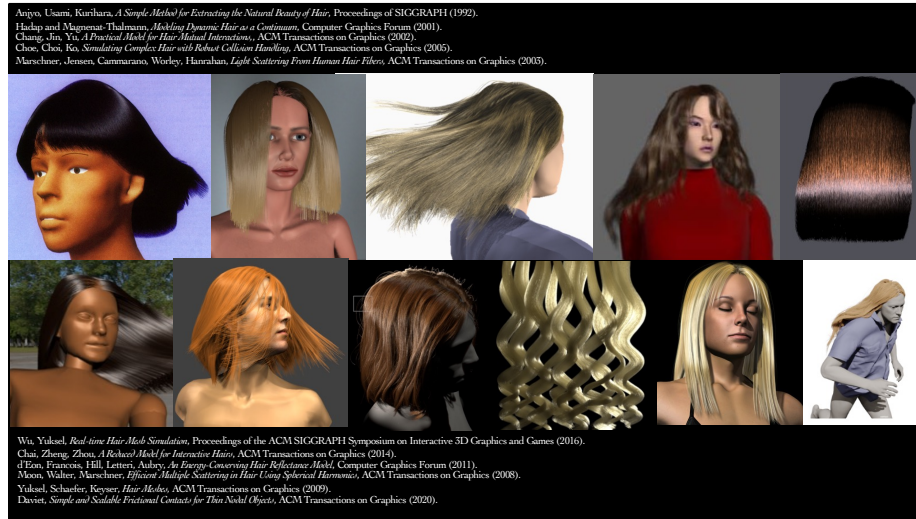
in computer graphics research have resulted, independent of any individual intent, in measurably biased outcomes. Our supplement provides further details and a bibliography.

Translucency and the corresponding physical mechanism of subsurface scattering has become synonymous with "human skin" in rendering. However, translucency is only the dominant visual feature of young, white Europeans and fair-skinned East Asians. We found 19 graphics publications, including the seminal works on the topic, that solely present renderings of white humans as evidence that subsurface scattering algorithms can faithfully depict "skin", "human skin" and "human faces." In at least 4 instances, this bias is then reflected in commercial software. Several other publi-

We submitted a Technical Talk on racial bias in the computer graphics literature.



It laid out a pattern of bias, at the technical level, over the last 20 years that showed that “skin rendering” algorithms were formulated to capture the specific features of white skin. Almost no Black skin showed up anywhere.



“Hair rendering and simulation” algorithms are specifically geared towards straight hair. No Type 4 hair, otherwise known as Afro-textured hair, ever showed up in a SIGGRAPH technical paper.

## Countering Racial Bias in Computer Graphics Research

Theodore Kim, Derek Nowrouzezahrai, Razi Syed, Wojciech Jarosz, A.M. Dai, Holly Rushmeier, Julie Dorsey, McGill University, Wellington, Dartmouth College, University of California, Santa Cruz

### ABSTRACT

Current computer graphics research produces content that has resulted in investigations in "skin" and "human faces" on the hegemonic visual features of Europeans and East Asians. We broaden our review of features to encompass all of human skin. We propose a variety of improvements to quantitative metrics and qualitative analyses and pose novel, open research problems.

Theodore Kim, Holly Rushmeier, Julie Dorsey, Derek Nowrouzezahrai, Razi Syed, Wojciech Jarosz, and A.M. Dai. 2021. Countering Racial Bias in Computer Graphics Research. In *Proceedings of Under Review*. ACM, New York, NY, USA. <https://doi.org/10.1145/1122445.1122456>

in computer graphics research have resulted, independent of any individual, in measurably biased outcomes. Our supplement further details and a bibliography.

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We submitted a two-page Technical Talk on this, and it was rejected. We got super-disturbing comments from the anonymous reviews.

**SIGGRAPH 2021**  
VIRTUAL 9-13 AUGUST

ABOUT THE CONFERENCE   PROGRAMS & EVENTS   THE EXHIBITION   PLAN TO ATTEND

SPOTLIGHTING DIVERSITY, EQUITY & INCLUSION

→ **ACM SIGGRAPH DIVERSITY, EQUITY & INCLUSION SUMMIT**

Hosted each year since 2018 by the ACM SIGGRAPH Diversity, Equity & Inclusion (DEI) Committee, the Diversity, Equity and Inclusion Summit spotlights how DEI makes our communities, industries, and teams stronger and how we can make our world more inclusive and accessible.

[VIEW PROGRAM CONTENT](#) →

The banner features a photograph of a man in a light blue shirt speaking at a podium. The background of the banner is yellow with black text and navigation elements.

Separately, I was invited to give a talk on this topic at the SIGGRAPH DEI Summit



The screenshot shows the SIGGRAPH 2021 Virtual program page. At the top, there are navigation links: ABOUT THE CONFERENCE, PROGRAMS & EVENTS, THE EXHIBITION, PLAN TO ATTEND (highlighted), VOLUNTEER WITH US, and REGISTER TODAY. Below this is the 'FULL PROGRAM' section with tabs for CONFERENCE SCHEDULE, CONTRIBUTORS, and ORGANIZATIONS. Under CONFERENCE SCHEDULE, there are tabs for ALL DAYS (selected), MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and ON DEMAND. Below the tabs are filters for ALL PROGRAMS, ALL KEYWORDS, and ALL INTEREST AREAS. The main content is for 'Monday, 9 August 2021', with 'Expand All' and 'Collapse All' options. A table lists sessions with columns for Time, Type, Session / Presentation, Contributors, and Tag. The first session, 'Anti-Racist Graphics Research', is highlighted with a red box. Other sessions include 'Equality, Diversity and Inclusion in British Pre-School Animation', 'Inspiring Digital Transformation Based on Empowering Diversity, Equity, Inclusion and Transdisciplinary Lifelong Learning Attitudes Through Coding and Visualizing Web3D Virtual Reality Spaces Since K-12 Education Levels', and 'Riding the Virtual New Wave: How to Utilize Virtual Production for Inclusive Cinematic Storytelling'.

Time	Type	Session / Presentation	Contributors	Tag
10am - 11am PDT	Diversity Equity & Inclusion Summit	Anti-Racist Graphics Research		This session WILL NOT be recorded.
11am - 12pm PDT	Diversity Equity & Inclusion Summit	Equality, Diversity and Inclusion in British Pre-School Animation		This session WILL be recorded.
2pm - 3pm PDT	Diversity Equity & Inclusion Summit	Inspiring Digital Transformation Based on Empowering Diversity, Equity, Inclusion and Transdisciplinary Lifelong Learning Attitudes Through Coding and Visualizing Web3D Virtual Reality Spaces Since K-12 Education Levels		This session WILL be recorded.
3pm - 4pm PDT	Diversity Equity & Inclusion Summit	Riding the Virtual New Wave: How to Utilize Virtual Production for Inclusive Cinematic Storytelling		This session WILL be recorded.

This talk here, “Anti-Racist Graphics Research”, so we were able to get this *some* of information out through a different channel.

# *Countering Bias in Computer Graphics Requires Structural Change*

Theodore Kim, Yale University  
Holly Rushmeier, Yale University  
Raqi Syed, Victoria University of Wellington  
Wojciech Jarosz, Dartmouth College

SIGGRAPH Birds of a Feather, [August 10, 2021](#)

We had a BOF after that talk, where we laid out what had happened, and planned for next year.

Here's the opening slide from my deck last year. Today is August 8 2022, right? Almost exactly one year ago.

Goal for SIGGRAPH 2022:

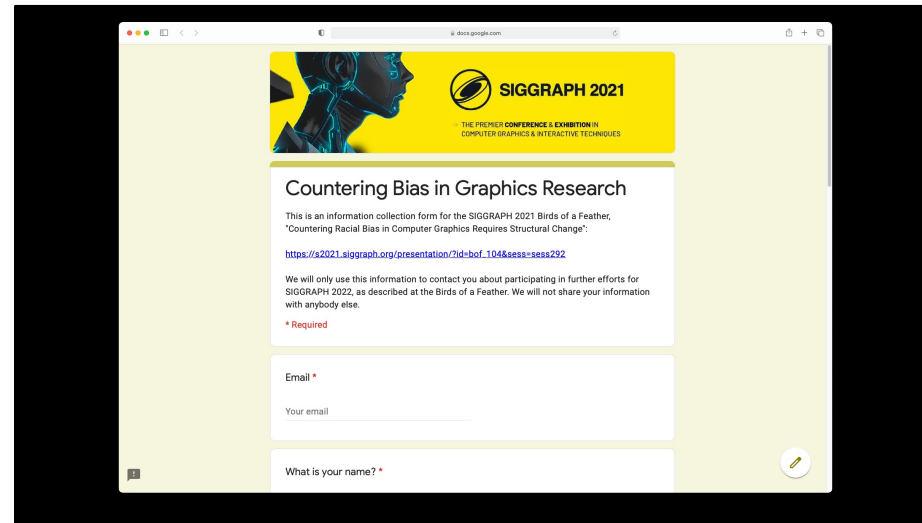
Have a discussion of technical bias  
*within the technical program.*

Racial Bias  
Gender Bias  
Ageism  
Ableism

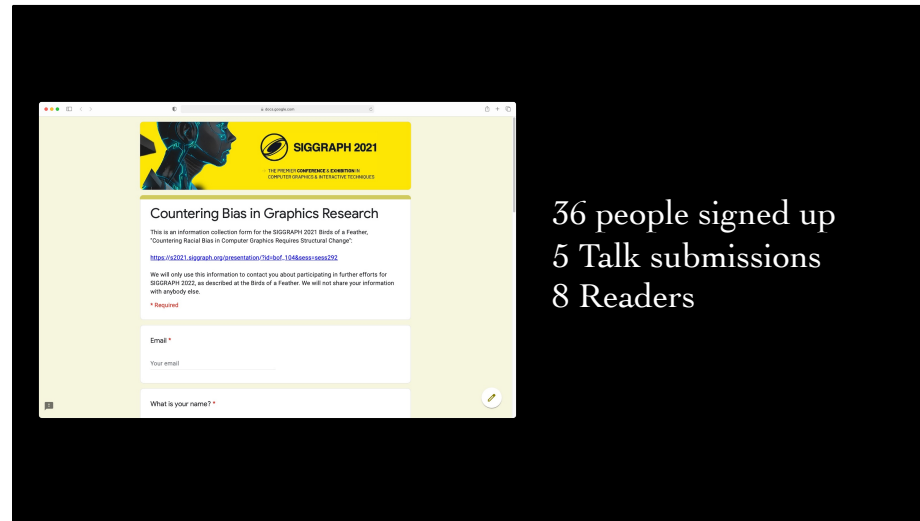
Here's the GOALS slide from last year. Have a discussion of technical bias *within the technical program.*

We then sent out a sign-up sheet inviting people to submit Technical Talks to SIGGRAPH 2022 on racial bias. One submission can easily be deflected, but let's see them reject half a dozen.

In a later follow-up conversation, I Professor Amanda Philips from Georgetown put it beautifully: "it's not a solo mission, it's a squad operation."



I sent out this signup form,



36 people signed up  
5 Talk submissions  
8 Readers

I sent out this sign-up form, and we had 36 people sign up for a variety of roles, including volunteering to write Talks.

From there we helped assemble five Talk submissions, and sent them out to a team of 8 readers,

who did a "Red Team" analysis of potential vulnerabilities.



**SIGGRAPH 2022**  
VANCOUVER+ 8-11 AUG

Then we submitted to SIGGRAPH and we waited.

on May 3<sup>rd</sup> .....



**SIGGRAPH 2022**  
VANCOUVER+ 8-11 AUG

Dear Theodore,

**CONGRATULATIONS!** Thank you for submitting your work to SIGGRAPH 2022. We are pleased to inform you that your Short Talk (20 minutes), gensub\_291s1, titled: "Countering Racial Bias in Computer Graphics Research" has been ACCEPTED to present in-person at SIGGRAPH 2022 in Vancouver, Canada. If you are no longer willing or able to present your Talk in person, please notify [talks-s2022@siggraph.org](mailto:talks-s2022@siggraph.org) no later than **Wednesday, 11 May 2022**.

ALL FIVE SUBMISSIONS GOT ACCEPTED

This was the polar opposite of last year – everything got accepted.

EVERYTHING GOT ACCEPTED.



ACHIEVEMENT UNLOCKED!!!

SUCCESS!

SUCCESS!

NOW FOR SOME VICTORY MUSIC!!!!



## A BIG THANK YOU



Ana Dodik



Haiwen (Haven) Feng



Silvia Sellán

The biggest thank you goes out to the *students* who stepped up to the plate, submitted a Talk, and presented it at SIGGRAPH.

So, Ana Dodik, Haven Feng and Silvia Sellan, the biggest thanks go to you. The courage you showed in assembling and presenting these works cannot be overstated.

To everybody else: these are ALL PhD STUDENTS. After they graduate and are on the market, and you're looking for researchers who will do the right thing, not the easy thing, these are the people. They bring it when it matters most.

Remember these three names. Ana Dodik, Haven Feng, Silvia Sellan.

## A BIG THANK YOU

Victoria Abrevaya

Michael Black

Timo Bolkart

Gordon Cameron

Jessica Heidt

Paul Kanyuk

Mara MacMahon

Jim Malazita

Joshua Minor

Peter Nye

Sofya Ogunseitan

Amanda Philips

Joachim Tesch

Emily Wilson

Second, a big thank you to all the faculty, post-docs, scientists, and industry folks who also stepped up to the plate.

Some of you organized alongside us, some of you trekked out on your own.

Either way, this success would never have happened without you.

## A BIG THANK YOU TO THE READERS

Finally, thanks to the readers who helped marshal these submissions through.

I am not actually 100% sure who wanted their names publicized, so to be on the safe side I'm leaving it anonymous. But, I know you braved some tight deadlines and a bunch of irritating, late-minute emails from me. So, thank you again.

You were integral to this success.

<https://siggraph2022.hubb.me/fe/schedule-builder/sessions/937731>  
<https://siggraph2022.hubb.me/fe/schedule-builder/sessions/937813>  
<https://siggraph2022.hubb.me/fe/schedule-builder/sessions/937815>  
<https://siggraph2022.hubb.me/fe/schedule-builder/sessions/937783>  
<https://siggraph2022.hubb.me/fe/schedule-builder/sessions/937741>  
<https://arxiv.org/abs/2103.15163>  
<https://arxiv.org/abs/2206.00480>  
<https://graphics.pixar.com/library/CharacterDiversity/index.html>  
<https://dl.acm.org/doi/10.1145/3532836.3536279>  
<https://graphics.pixar.com/library/Cornrows/index.html>  
<https://dl.acm.org/doi/10.1145/3532724.3535598>

Here's all the talks from this year. The Hubb.me links, and links to the PDF extended abstracts.

Look at this big beautiful list. Last year this slide was empty.

I'll cut and paste it into the chat window so you can save them for later.

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To encourage you to go see some of this content, we have both Professors Syed and Malazita here giving brief overviews of what they talk about elsewhere at SIGGRAPH.

I'm now going to hand the mic to them. After that, we'll come back and talk about next steps for next year.