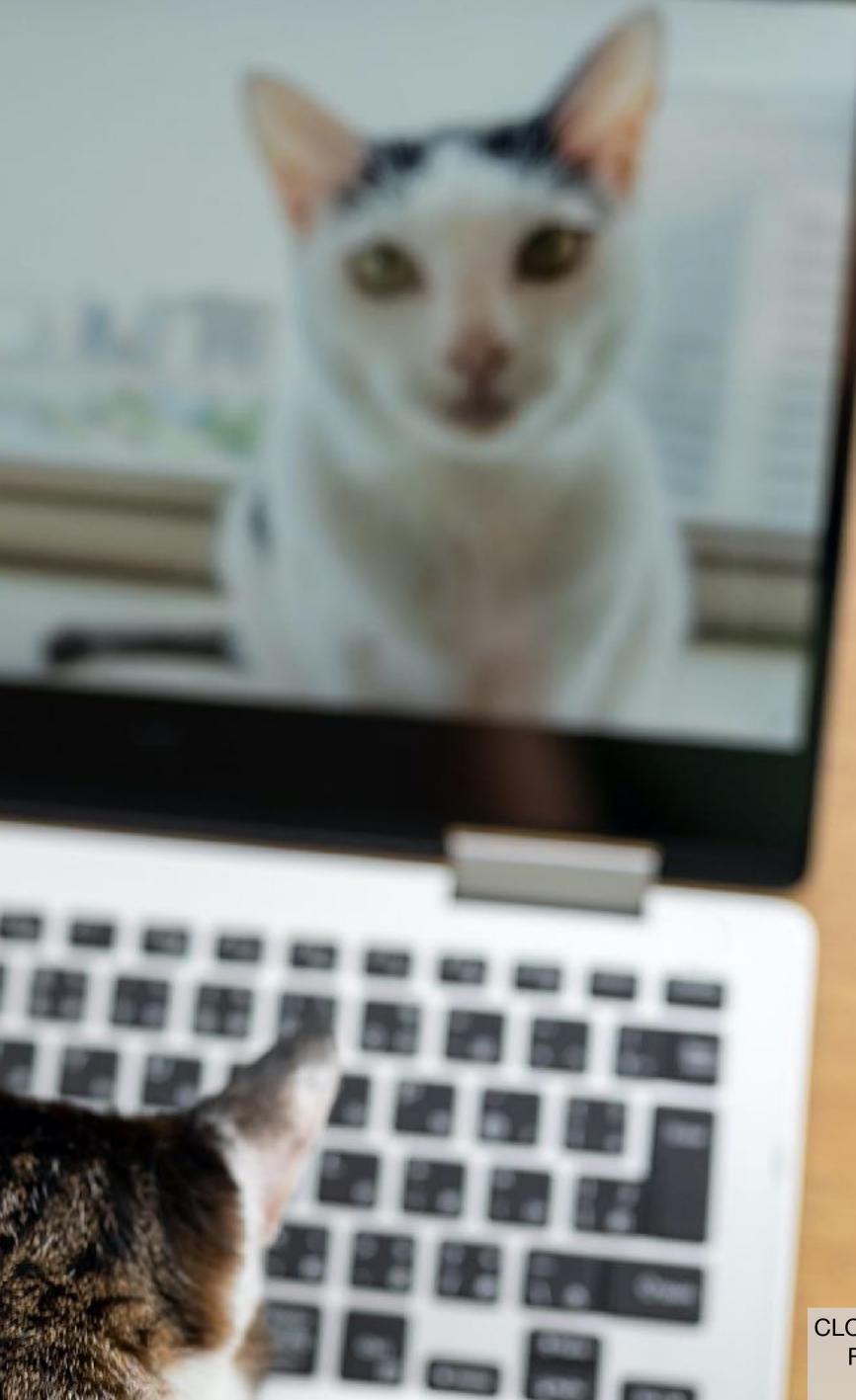
# CLOWDR

### Conferences Located Online With Digital Resources

## Virtual conference platform

**Jonathan Bell, Crista Lopes and Benjamin Pierce** 



CLOWDR is supported by the National Science Foundation under awards CCF-2035003, CCF-2035101 and CCF-203500



# **Physical Conference Recipe**

## **Paper Presentations**

## **Snacking + Networking**

### **Poster Presentations + Networking**

## **Tourism + Networking**







# Academic Communities Meeting Virtually A socio-technical problem with unique academic challenges

- Technology:
  - How to provide opportunities to discover who else is attending and interact?
  - How to organize all of the synchronous and asynchronous video in one place?
  - How to organize chat around the technical program?

- Social:
  - What is the barrier to introducing yourself?
  - When should you be online?
  - Cameras on/off?
  - How to have casual interactions?
  - How to keep the discussion going after the conference?

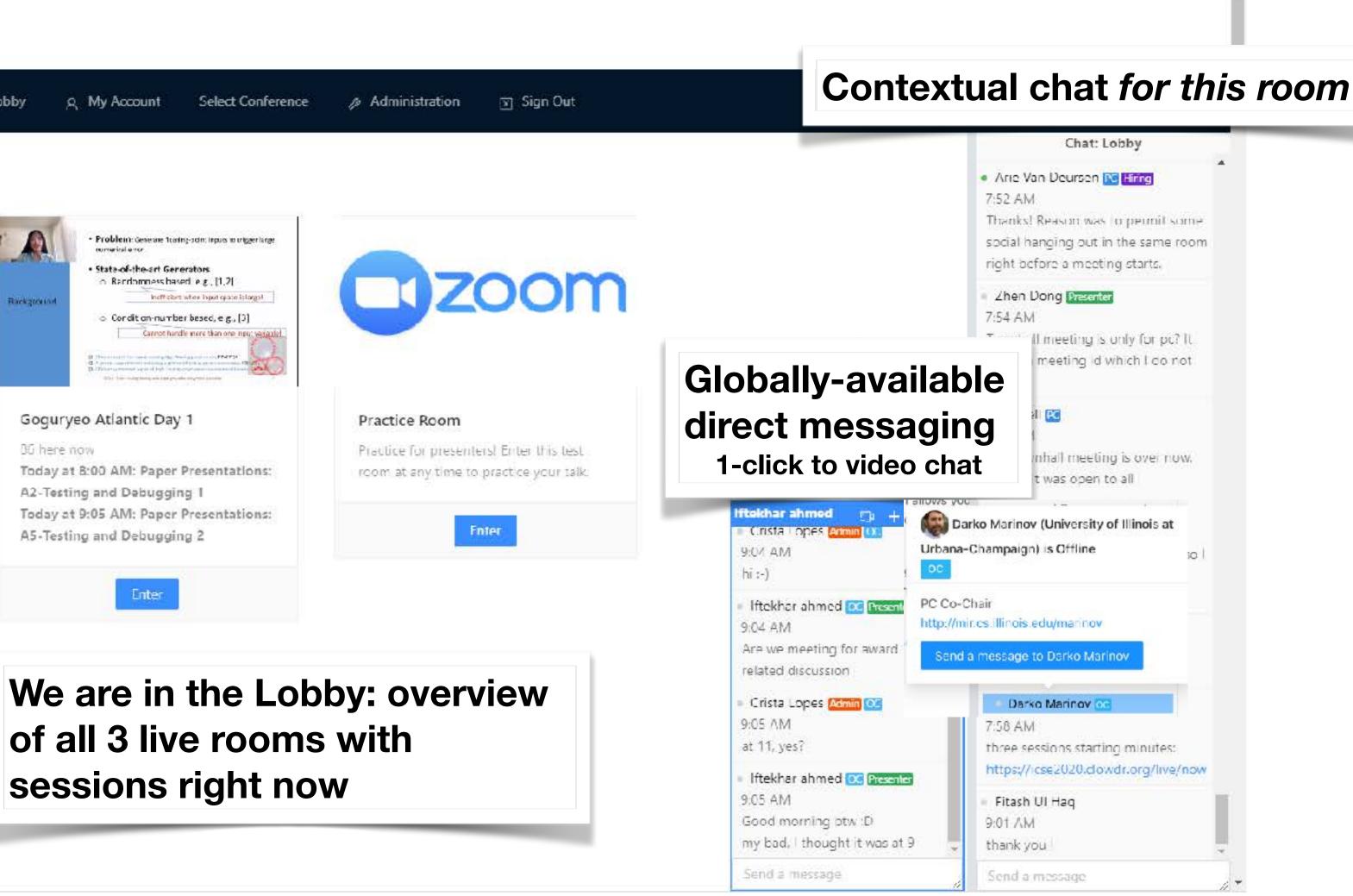
## **CLOWDR: A Successful Beta Deployment @ ICSE** ~1500 logged on to the platform overall

 $\leftarrow \rightarrow C$ icse2020.clowdi.org/live/now The 42<sup>rd</sup> International Conference on Software Engineering CSE 2020 The Sessions & Exhibit Hall Video Chat Lobby g. My Account (#3) Program **10 most recent participants** now: to join this room mings Change Problem: Generate Tearing-adm: Inputs to origger large Lobby numerical error State-of-the-art Generators Mohammed SAYAGH o Bandomness based e.g. [1,2] Ineff clart when input space is large! Abdulrahman Alshammari Backgowing Condition-number based, e.g., [3] Cindy Rubio Gonzalez Carnot handle more than one npu: variable Danny Dig Tri Minh Triet Pham Thenhao Li SV Tingting Yu Baekje Atlantic Day 1 Goguryeo Atlantic Day 1 Abdullah Bokhary Himo 61 here now **BG** here now Akinori Ihara Today at 8:00 AM: Paper Presentations: Today at 8:00 AM: Paper Presentations: Sebastian Proksch A1-Autonomous Driving Systems A2-Testing and Debugging I 276 total ¥ Today at 9:05 AM: Paper Presentations: Today at 9:05 AM: Paper Presentations: Chats A4-Cyber-Physical Systems A5-Testing and Debugging 2 Iffekhar almed Announcements Enter Enter Video Breakout Rooms Hallway 2 Hallway 1 Presenting and Evaluating the Hallway 4 Benjamin Pierce Admin Impact of Experiential Learning in Computing Accessibility Education Hallway 7 of all 3 live rooms with Hallway 6 Weish Shi, Yasmine El-Glaly, Gamuel Malachowsky Hallway 3 Gi Yu and Daniel Krutz sessions right now Rochecter Institute of Technology Hallway 5 http://sil.rit.edu

Silla Atlantic Day 1

74 here how

Hallway Track





0 0 1 1 1 1 1 1 1

# Watching talks

icse2020.clowdr.org/live/now/O'Hearn%20Keynote%20Atlantic%20Day%203  $\leftarrow \rightarrow$ C

The 42<sup>st</sup> International Conference on Software Engineering

xhibit Hall

🚓 Video Chat Lobby

### **10 most recent participants** to join this room. Still see all 169 by expanding

dialit ife

### O'Hearn Keynote Atlantic Day 3

- Danny Groenewegen
- Denvs Poshyvanyk
- Janet Burge Hinng
- Andreas Zeller Hirty
- Massimiliano Di Penta 😰 Hring
- Kevin Moran Presenter
- Bruno Lima Presenter
- Michal Dolezel
- Sarah Elder
- Shahar Maoz Hiring 169 total ¥

Q My Account

post land batch: ~0% fix rate

diff time continuous : ~70% fix rate

### 

antic Day 3

0 

### Select Conference Administration

[X] Sign Out

### **Contextual Chat**



same analysis (Infer)

Chat: O'Hearn Keynote Atlantic Day 3 Anita Sarma CC Presenter 8:10 AM 000000 Joad F. Ferreira Presenter 8:13 AM 3 Andreas Zeller Hing 8:13 AM clap clap clap Darko Marinov DG 8:14 AM #1 reminder you can use this area. for chat/comments during talks; for questions for the presenter, you can use the Slido widget on the left (may need some scrolling up and down to find) analyzing Emacs :) José Miguel Rojas 00 SW 8:16 AM lost cause Darko, was there a #2 reminder. Coming? Darko Marinov 003 9.71 014 e keynote, sorry; it's for **Globally-available** paper session Miguel Rojas 🚾 🛐 direct messaging en you can upvote / questions on slido :)

# Chat centered around the program **NOT centered around slack's interface!**

SSTA 2020 ~	#day1-1050-fuzzing 🕸 🔍 3   Add a topic
<ul> <li>Threads</li> <li>Mentions &amp; reactions</li> <li>Drafts</li> <li>Saved items</li> <li>Channel browser</li> <li>People</li> <li>Apps</li> <li>Files</li> </ul>	Slack-based conference (NOT Clowdr)
↑ Show less	#day1-1050-fuzzing
• Channels + # announcements # coffee-break	You created this channel on July 11th. This is the very beginning of the #day1-1050-fuzzing channel.
// day1-0900-keynote	Jonathan Bell 11:30 AM
// day1-1050-fuzzing	joined #day1-1050-fuzzing.
<ul> <li># day1-1210-symbolic-exec</li> <li># day1-1330-repair-and-de</li> <li># day1-1450-mobile-apps</li> <li># day1-1610-machine-lear</li> <li># day2-0900-awards-keyn</li> <li># day2-1050-machine-lear</li> </ul>	<ul> <li>Pinned by you</li> <li>Jonathan Bell 11:58 AM</li> <li>Please post questions for "WEIZZ: Automatic Grey-box Fuzzing for Structured Binary Formats" by replying to this thread</li> <li>Pinned by you</li> <li>Please post questions for "Active Fuzzing for Testing and Securing Cyber-Physical Systems" by replying to this thread</li> <li>Please post questions for "Learning Input Tokens for Effective Fuzzing" by replying to this thread</li> </ul>
# day2-1210-bug-localizati # day2-1330-security # day2-1450-regression-te	Mattia Fazzini 12:24 PM joined #day1-1050-fuzzing along with 5 others.
# day2-1610-challenging-d	Monday, July 13th 🗸
# day3-0900-keγnote # day3-1050-binary-analysis # day3-1210-static-analysi # day3-1330-build-testing	Jonathan Bell 9:24 AM         cleared the channel topic         Jonathan Bell 10:49 AM         joined #day1-1050-fuzzing along with 7 others.
# day3-1450-numerical-an # day3-1630-tool-demos	Message #day1-1050-fuzzing
# doctoral-symposium # intros	

Improving the Effectiveness of Traceability Link Recovery using Hierarchical Bayesian Networks

William & Mary Department of Computer Science Cisco Systems

Advancec Security Research Group

42nd International Conference on Software Engineering (ICSE'20)

Wednesday, July 8th, 2020



1 here now

07/08/2020: Paper Presentations: A9-Traceability

A Novel Approach to Tracing Safety Requirements and State-Based Design Models

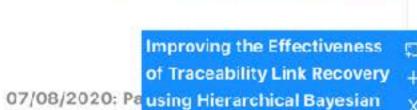
Establishing Multilevel Test-to-Code Traceability Links Empirical Assess

Practical Fault De

RTj: a Java frame

Testing

**CLOWDR:** Each paper/poster gets its own chat channel, cross-linked to program/ authors/live sessions, can be archived.



Networks (4 members)

Anderson Oliveira 11:59 AM

Q: How were links between source artifacts were determined, for computing the transitive links with target artifacts?

Send a message

Neil Ernst 11:58 AM Kevin can you repost that short URL?

Jane Cleland-Huang oc 11:59 AM Thanks to all the presenters, Its great to actually have an

(almost) entire session on Traceability!

11:59 AM URL of the project here: https://semeru-codepublic.gitlab.io/Project-Websites/comet-website/

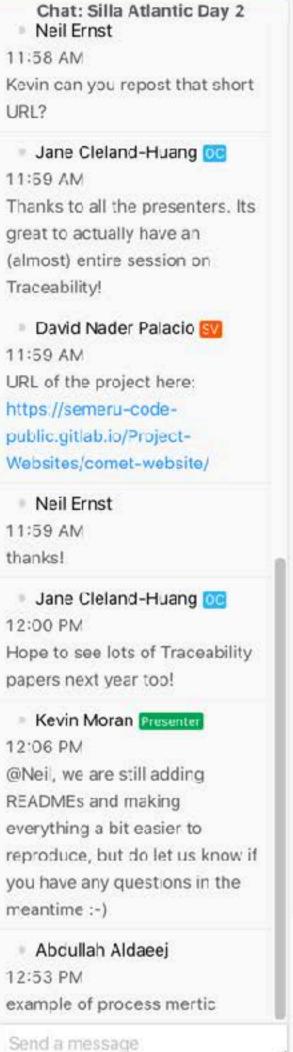
Neil Ernst 11:59 AM thanks!

Jane Cleland-Huang OC 12:00 PM Hope to see lots of Traceability papers next year too!

Kevin Moran Presenter 12:06 PM @Neil, we are still adding READMEs and making everything a bit easier to you have any questions in the meantime :-)

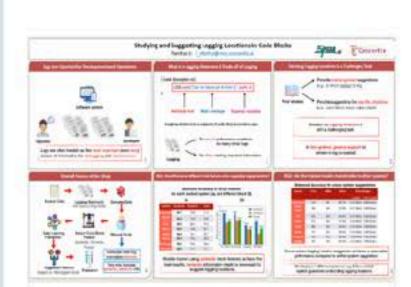
Abdullah Aldaeej 12:53 PM example of process mertic

Send a message



# Hallway & Posters Tracks Participants can make their own public/private vid

CSe2U2U.clowdr.org/	100 DY	
⊖ Home 😁 Program	The 42 <sup>-4</sup> International Conference on Software Engineering Important: participation of the second	- a Administration
Search for people and rooths v  Ny status:  Provide Sam Aaron  Lobby  Collin Raphael Himg  Theodolic Merice	Awards session         BOF - Static Analysis         Enc Bodden Films         Radu Prekup S         Ivan Pashchenko Prezenter         Sebastian Nielebock Prezenter	<ul> <li>Myra Cohen R</li> <li>Wing Lam Presenter</li> <li>Sruti Srinivasa Ragavan Presenter</li> <li>Reyhaneh Jabbarvand Hinng</li> <li>Yu Huang Presenter</li> </ul>
<ul> <li>ThanhVu Nouven</li> <li>Junwen Yang Presenter</li> <li>Andrew Elsey</li> <li>Janet Burge Himo</li> <li>Diomidis Spinellis PC</li> <li>Rachelle Hippler</li> <li>Enrico Vicario</li> <li>Gul Calikli</li> </ul>	<ul> <li>Joshua Garcia Presenter</li> <li>Joshua Garcia Presenter</li> <li>Andreas Dann Presenter</li> <li>Guido Salvaneschi (Hiring)</li> <li>Andrew Habib Job market</li> <li>Rodrigo Bonifacio</li> <li>ESEC-FSE2020-Coorgs</li> <li>Elevator alks all welcome</li> </ul>	<ul> <li>ThanhVu Nguyan</li> <li>Sam Malek CG PC</li> <li>August Shi Hring</li> <li>Keynote Foyer 1</li> <li>Learning from, Understanding, and Supporting DevOps Artifacts</li> <li>Jordan Henkel Presenter</li> <li>Fair Frooramming Discussion</li> <li>Tranz Zieris Presenter</li> </ul>
<ul> <li>Andrew Habib Job market 289 total ¥</li> </ul>	SRC Poster Area	
Chats Announcements X Sol Greenspan X Video Breakout Rooms Video Breakout Rooms OF Static Analysis Enic Bodden Hiring Radu Prekup  Vian Pashchenko Piesente Vian Pashchenko Piesente Vian Garcia Presente Andreas Dann Prese	<ul> <li>An Automated Framework For Gaming Platform To Test Multiple Games</li> <li>2 Jihe Song Michael Hilton</li> <li>An empirical study of the first contributions of developers to open source projects or GitHub</li> <li>An Empirical Study on the Evolution of Test Smell</li> <li>Dong Jae Kim Presente</li> <li>Automated Analysis of Inter Parameter Dependencies in Web APIs</li> <li>Automatic Generation of Simulink Models to Find Bugs in Cyber-Physical System Tool Chain using Deep Learning Sohil Shrestho SV Presente</li> <li>Christoph Csaliner</li> <li>Denae Ford R</li> <li>Denae Ford R</li> </ul>	<ul> <li>Building a Theory of Software Teams Organization in a Continuous Delivery Context</li> <li>Detection and Mitication of JIT-Induced Side Channels Do Preparatory Programming Lab Sessions Contribute t Work Distribution in Student Icams?</li> <li>Does Fixino Bug Increase Robustness in Deep Learning?</li> <li>Efficient test execution in End to End testing</li> <li>Cristian Augusto Alonso</li> <li>Brittany Johnson Preerts</li> <li>Modhusudan Srinivasan</li> <li>Evaluation of brain activity while Pair Programming Exploring the Relationship between Dockerfile Quality a Project Charateristics</li> <li>Importance-Driven Deep Learning System Testing Improving Bug Detection and Fixing via Code Represent Learning</li> <li>Yi Li Presenter</li> </ul>
Rodrigo Bonifacio     ievatorTalks-all welcome	Poster Areas	LOSS Dimensional Structure & Orabitation Structure



Studying and Suggesting Loggi... Zhenhao Li

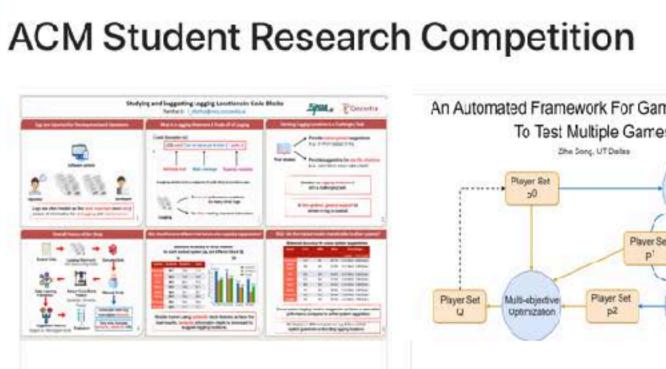
An Empirical Study on the Evolu...

Generation of Simulink Models to Find Bugs in Cyber-Physical System Tool Chain using Deep Learning

SE%202020/Learning%20trom.%20U

Dong Jae Kim

what a the ph



An Automated Framewor Zihe Song

mpirical Study on the Secret Life of Test Smells	Pommia Spelle
and the second state of th	an in an in the through the it

E heat require the silvar of one E existing the shot suff. 3 Cest Evention if tailes a that are reliant expanse autoriting selved arcrist Consiste avera B Resource Monthination Television of In afferent seturces hat each hert unter regurant alima Abees Ta Telfate 3M of Galilland

115-

Cristian Augusto

Overview due is a word methodology for validating t

of JIT-Induced Side Channels ming Lab Sessions Contribute to Even tudent leams?

Administration

Sign Out

ty while Pair Programming ip between Dockerfile Quality and

Learning System Testing and Fixing via Code Representation

### Public Hangout 4 Public Hangout 5 Public Handout 6 Same for posters!

Alexander Serebrenik PC (fining)

Sebastian Baltes Presenter

Anita Sarma CC Presenter

Mary Sánchez-Gordón

Fatemeh Hendijani Fard (Hiring)

Nathan Cassee

Pooja Rani

Public Hangout 1 Public Handout 2

Public Handout 3

Paulo Roberto Farah

### Kevin Moran Presenter

Machine Translation Testing via Pathological Invaria Open-Vocabulary Models for Source Code (Extended Playing With Your Project Data in Scrum Retrospectiv Recognizing Developers' Emotions while Programm Refactor4Green: A Game for Novice Programmers to Code Smells

Stress Testing SMT Solvers via Type-aware Mutation Studying and Suggesting Logging Locations in Code Zhenhao Li SV

🔹 Nan Yang 🔂

The Role of Egocentric Bias in Undergraduate Agile Development Teams

Towards Automated Migration for Blockchain based Decentralized Application

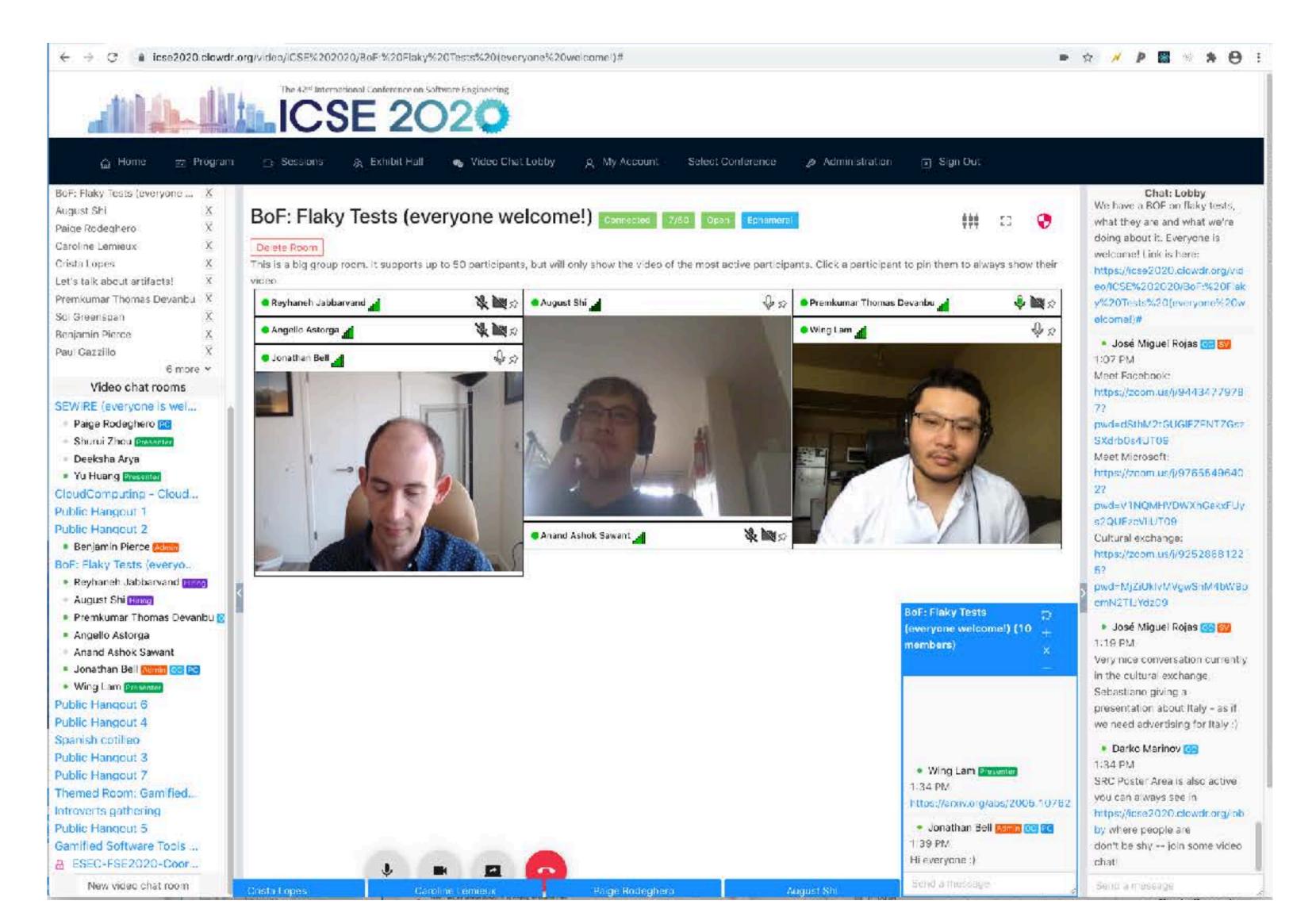
Uncertainty-Guided Testing and Robustness Enhan Deep Learning Systems

Partie Angele - and States			
Recurs			
Processing committy computer any entering			
durble-celebration of one of anony test passer.			
Downie aut state metoco Atribute			
· Explanding room happened, oil sharts			
The second secon			
· Dasfedy output to record indication			
Providence of the other of the open internation			
· Electricity Cost school such materials and re-			
· Annen Made Theats in dish a mounter			
unpicted by / test case			
Cristiation (STOROS)   Incomes			
Scheming Orpiognest			
A REPORT OF A R			
That definition Tortynation of the Ch			
file broase and reading			
the second			

Efficient test execution in



## Hallway & Posters Tracks 364 users used this; 146 spent over 20 mins, 77 over 1 hour, total: 250 hours!



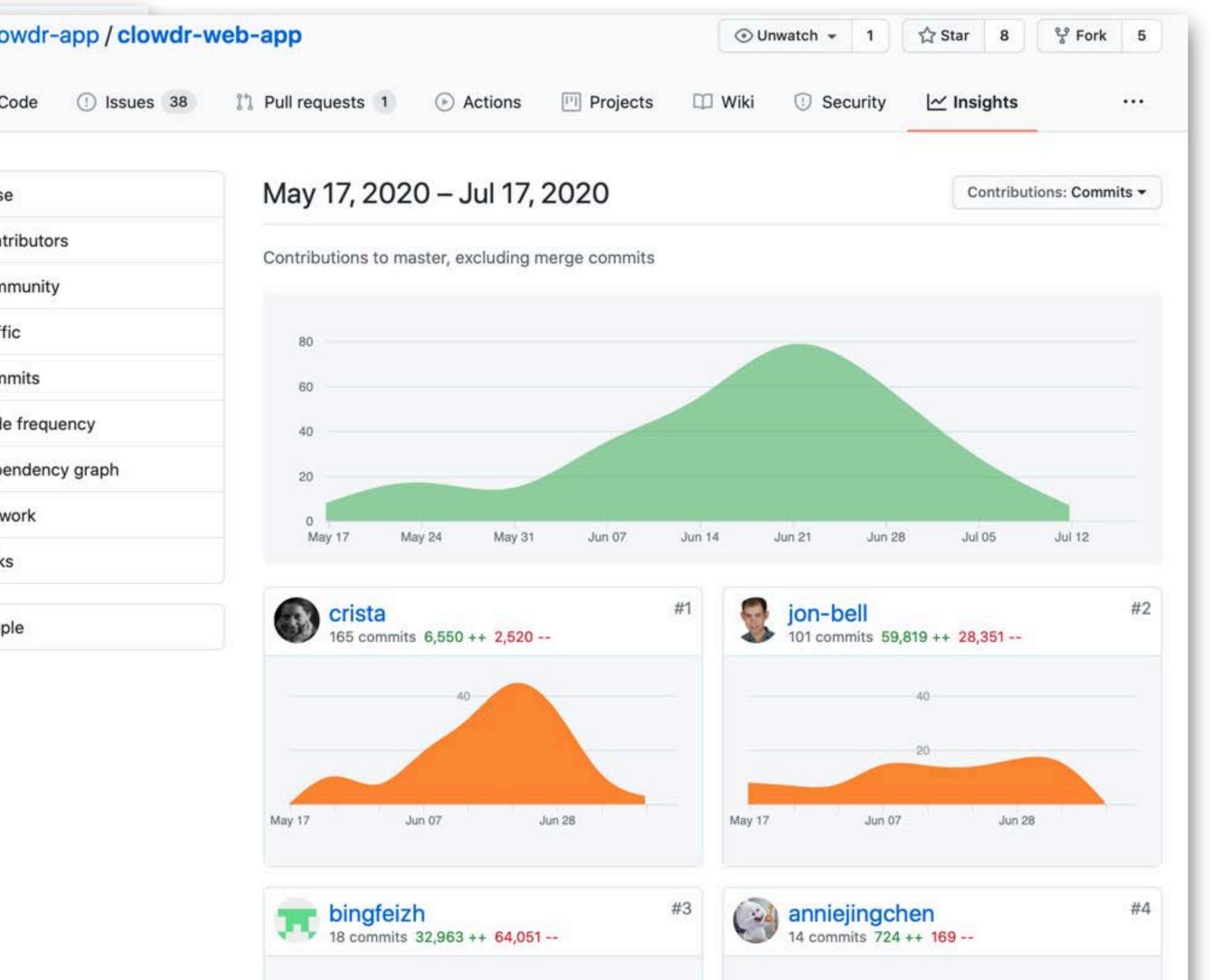
# **Deployment costs and infrastructure**

- Conference maintains complete ownership of the data. App is open source.
- Frontend: react, "almost" no backend <u>ParsePlatform</u>, we used hosting from <u>Back4App</u>
  - <\$100, could have chosen a cheaper plan. Replicated across multiple continents, good fault tolerance story. Installation easily shared among multiple conferences
- Program imported from <u>conf.researchr.org</u>, can make live edits Backend load during ICSE (~1500 participants) Server capacity (80 req/sec) Video: Live sessions - Zoom, YouTube, IQYI Breakout sessions - Twilio (Unlimited rooms, less than 1 cent/min/person Chat - Twilio (Unlimited channels, \$0.02/active user/month) Actual load (spikes ~30 reg/sec) • \$500 free credits available from Twilio for non-profits impacted by COVID-19. Total deployment cost to ICSE was ~\$100 (just hosting).



# **Open technical problems** HUGE feature wishlist, looking for contributors!

🖵 cl	owdr-app / clowdr-web-app ○ Unwatch → 1 ☆ Star	
<> (	Code ① Issues 38 11 Pull requests 1 ③ Actions III Projects III Wiki ① Security	<> C
Filte	How do best mix P2P video +	Pulse
() 38	open v 40 chat + content?	Cont
1 in	Author - Label - Projects - Milestones - Assignee - Sort -	Com
~		Traff
0	Add push-to-talk to video chats     #74 opened 2 days ago by jon-bell	Com
0	① Posters / Poster "UI card" images	Code
	#71 opened 3 days ago by bcpierce00	Depe
0	Zoom-hosted chat rooms     #70 opened 3 days ago by bcpierce00	Netw
0	Pie in the sky / Push notifications for messages #69 opened 3 days ago by bcpierce00	Fork
0	Pie in the sky / Watch parties     #68 opened 3 days ago by bcpierce00	Peop
0	Pie in the sky / Add emotes on live rooms #67 opened 3 days ago by bcpierce00	
0	Emoji nits     #66 opened 3 days ago by bcpierce00 🕖 0 of 2	
D	Admin / user-defined flairs     #65 opened 3 days ago by bcpierce00	
0	User-created public channels     #64 opened 3 days ago by bcpierce00	
0	① Admin / Add profile field for hobbies	



# **Open social problems** How do we encourage casual conversation?

## Demo (Time Permitting) - <u>https://icse2020.clowdr.org</u> Get access to try it yourself: <u>welcome@clowdr.org</u>

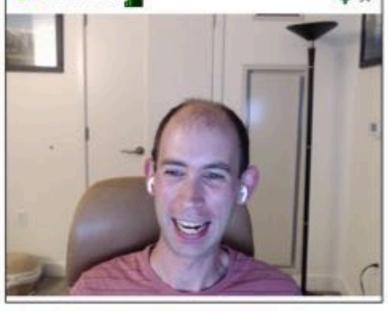


2017: Buenos Aires

This is a big group room. It supports up to 50 participants, but will only show the video of the 4 most active participants. Click a participant to pin them to always show their video. You are muted by default in this room, please unmute yourself if you want to talk.



Jonathan Bell 1



2020: CLOWDR



# **Physical Conference Recipe**

### **ICSE 202**

### A stark lesson (2014)

- post land batch: ~0% fix rate
- diff time continuous : ~70% fix rate
- same analysis (Infer)

## **Paper Presentations**

## **Snacking + Networking**

### ICSE 2020

	Awards session	<ul> <li>Myra Cohe</li> </ul>
	BOF - Static Analysis	<ul> <li>Wing Lam I</li> </ul>
	<ul> <li>Enc Bodden (Hinna)</li> </ul>	Sruti Sriniv.
	Radu Prekup 100	<ul> <li>Reynaneh J</li> </ul>
	Ivan Pashchenko Presenter	• Yu Huang
	<ul> <li>Sebastian Nielebuck Preener</li> </ul>	<ul> <li>ThanhVu N</li> </ul>
	<ul> <li>Joshua Garcia Presente</li> </ul>	- Sam Malek
	<ul> <li>Andreas Dann Presenter</li> </ul>	
	<ul> <li>Guido Salvaneschi Hinng</li> </ul>	August Shi Keynote Fover
	<ul> <li>Andrew Habib Ico market</li> </ul>	Learning from
	<ul> <li>Rodrigo Bonifacio</li> </ul>	Artifacts
	ESEC-FSE2020-Coorgs	<ul> <li>Jordan Her</li> </ul>
	Elevator alks all welcome	Fair Frocramm
		<ul> <li>I ranz Zieri:</li> </ul>
	SRC Poster Area	
-	An Automated Framework For Gaming Platform To Test Multiple Games	Building a The Continuous
	<ul> <li>Zihe Song</li> </ul>	Detection and
<	Michael Hilton	Do Preparator Work Distri
	An empirical study of the first contributions of developers to	Does Fixing Bu
	open source projects on GitHub	Efficient test e
	An Empirical Study on the Evolution of Test Smell Dong Jae Kim Press	<ul> <li>Cristian Au</li> </ul>
	Automated Analysis of Inter Parameter Dependencies in Web	<ul> <li>Brittany Jol</li> </ul>
	APIs	<ul> <li>Madhusudi</li> </ul>
	Automatic Generation of Simulink Models to Find Bugs in Cyber-Physical System Tool Chain using Deep Learning	Evaluation of I Exploring the

d Supporting DevOps	Purga Rani     Mary Sancher-Gort     Totten-Handijani Public Handout 1 Aublic Handout 2 Public Handout 3 Public Handout 3 Public Handout 3 Public Handout 3 Public Handout 7
ns Organization in a	<ul> <li>Paulo Roberto Fara</li> </ul>
duced Side Channels	Kevin Moran Present
Sessions Contribute to Even cams? ess in Deep Learninu?	Machine Translation T Open-Vocabulary Mo Playing With Your Pro

### **Poster Presentations + Networking**

### ICSE 2020





## **Tourism + Networking**





