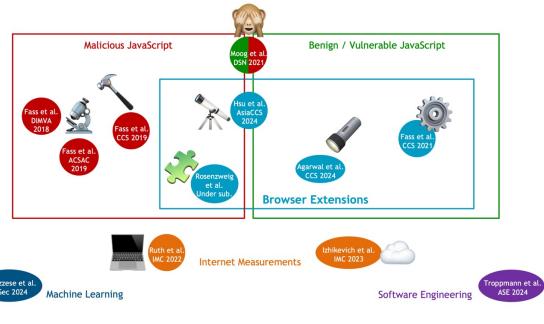


Dos and Don'ts of Reviewing

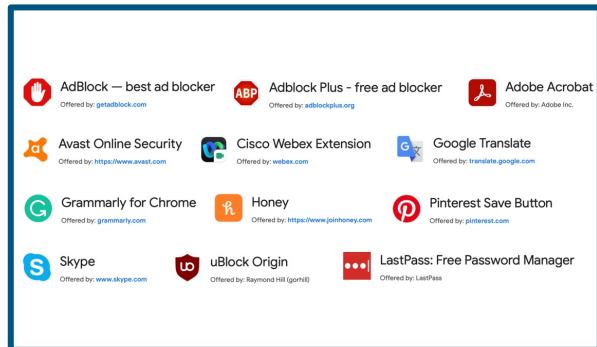
Aurore Fass

Tenure-Track Faculty at CISPA – Helmholtz Center for Information Security

Agenda



Research Work

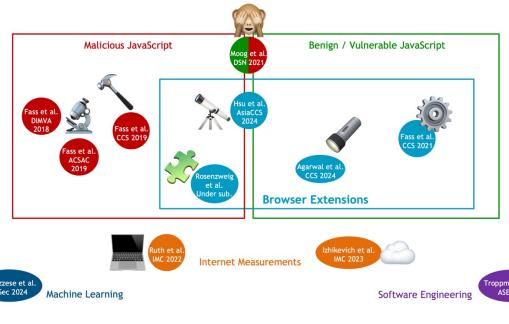


Browser Extensions

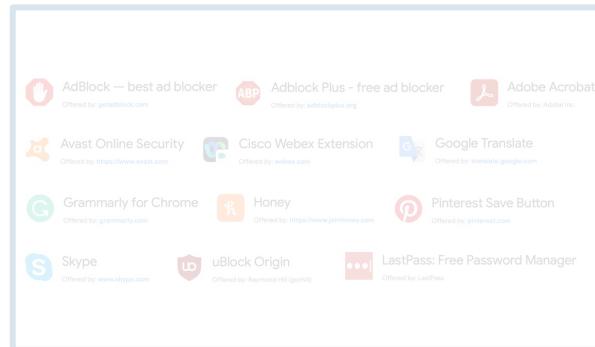
Reviewing



Agenda



Research Work

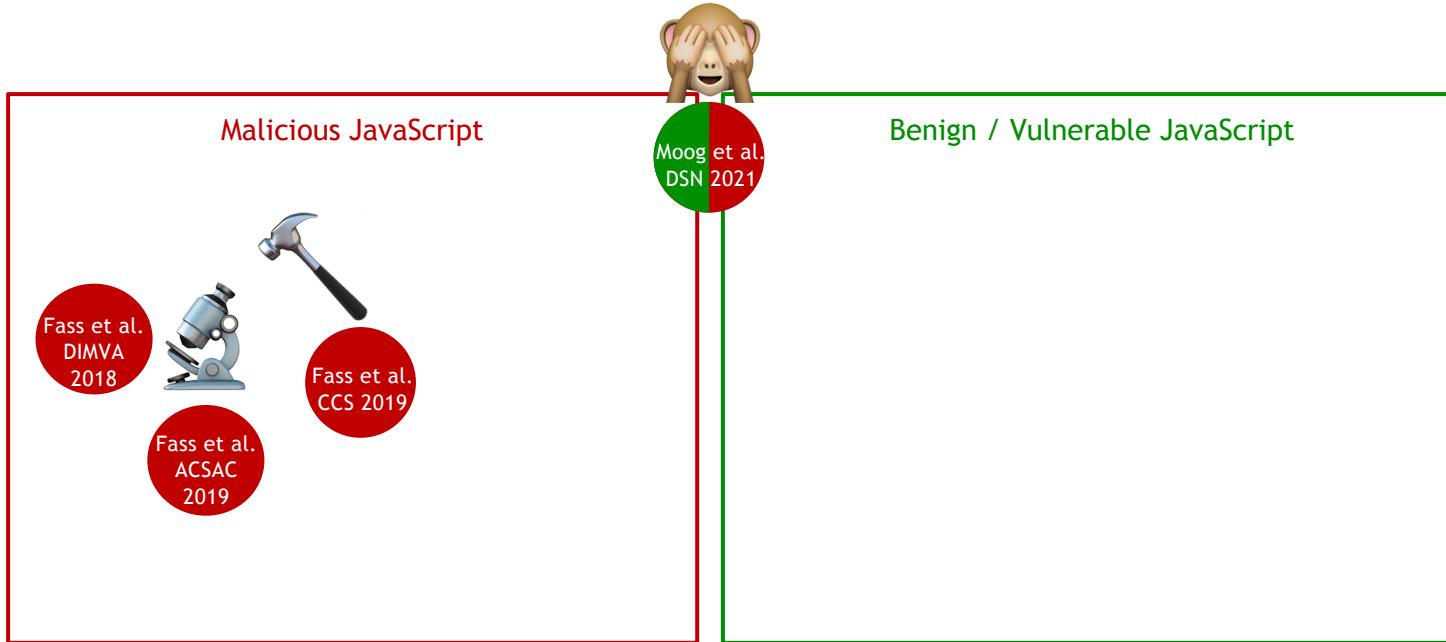


Browser Extensions

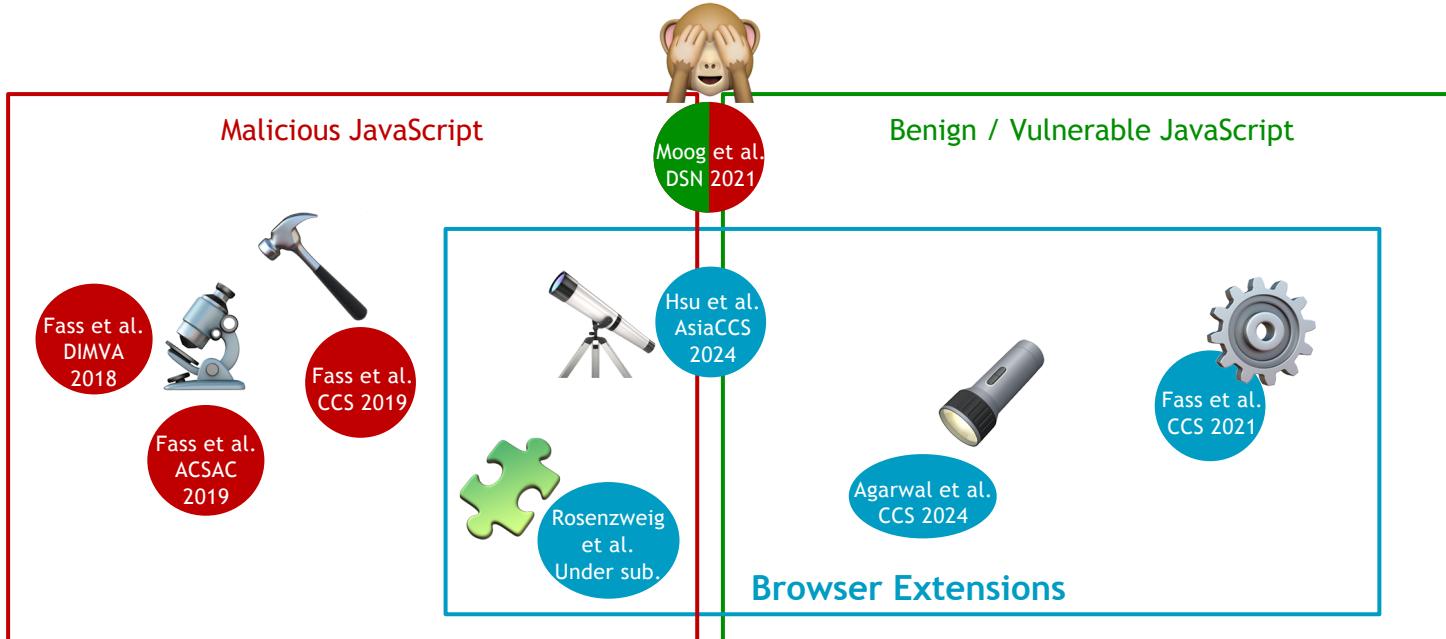
Reviewing



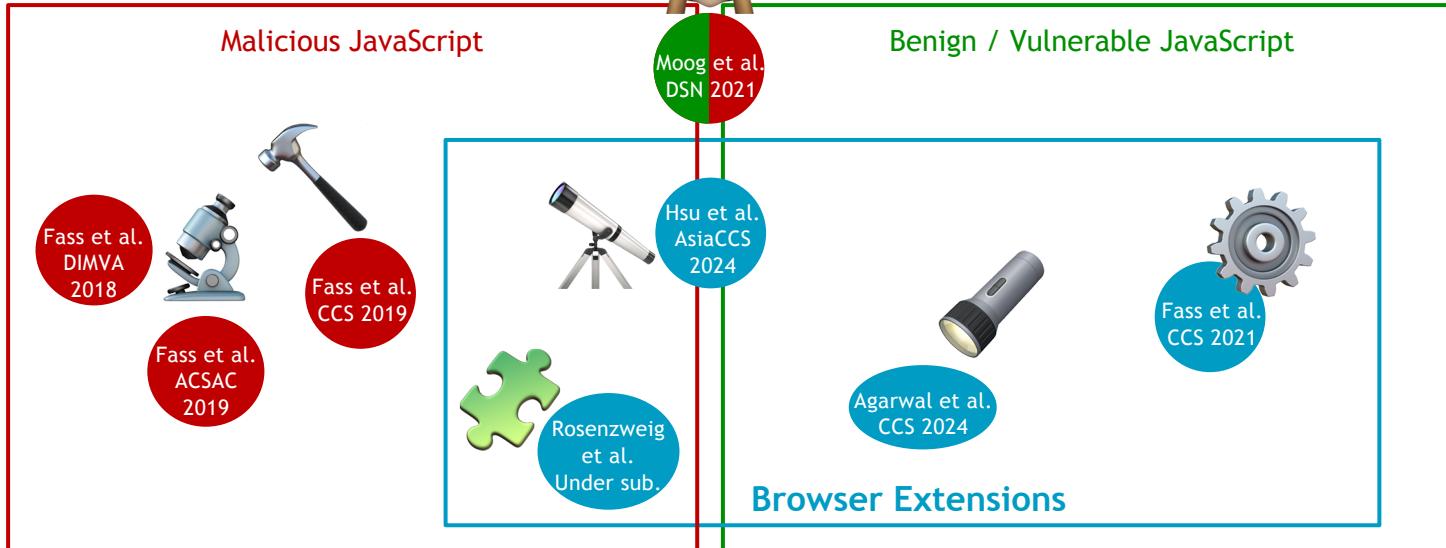
Research Work: Web Security & Privacy



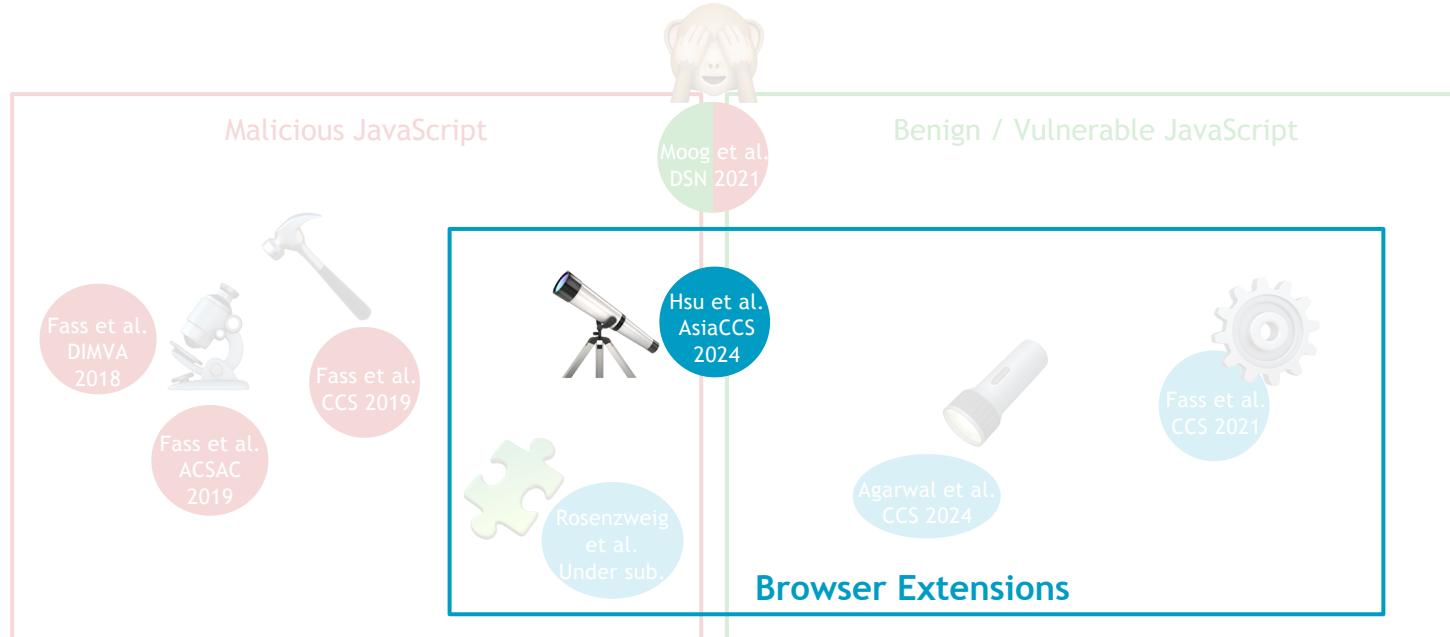
Research Work: Web Security & Privacy



Research Work: Web Security & Privacy



Research Work: Web Security & Privacy



Apruzzese et al.
AISeC 2024

Machine Learning

Ruth et al.
IMC 2022

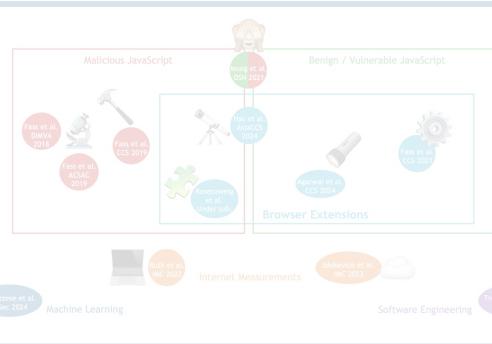
Internet Measurements

Izhikevich et al.
IMC 2023

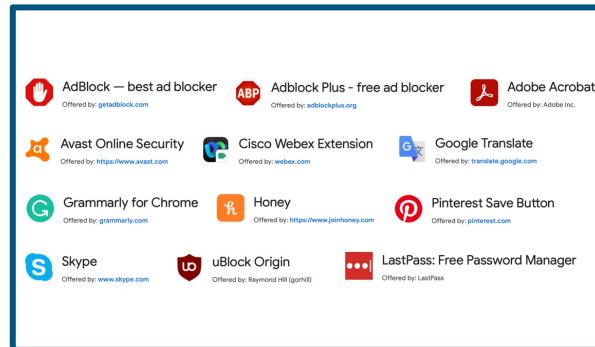
Software Engineering

Troppmann et al.
ASE 2024

Agenda



Research Work



Browser Extensions

Reviewing



What are Browser Extensions?

- Third-party programs to **improve user browsing experience**



AdBlock — best ad blocker

Offered by: getadblock.com



Adblock Plus - free ad blocker

Offered by: adblockplus.org



Adobe Acrobat

Offered by: Adobe Inc.



Avast Online Security

Offered by: <https://www.avast.com>



Cisco Webex Extension

Offered by: webex.com



Google Translate

Offered by: translate.google.com



Grammarly for Chrome

Offered by: grammarly.com



Honey

Offered by: <https://www.joinhoney.com>



Pinterest Save Button

Offered by: pinterest.com



Skype

Offered by: www.skype.com



uBlock Origin

Offered by: Raymond Hill (gorhill)



LastPass: Free Password Manager

Offered by: LastPass

- 125k Chrome extensions totaling over 1.6B active users

How Safe are Browser Extensions?

- Browser extensions provide additional functionality...
 - ... so browser extensions need additional & elevated privileges compared to web pages
- Browser extensions are an attractive target for attackers 😈

→ Extensions can put their users' security & privacy at risk

- Contain **malware**

- Designed by malicious actors to harm victims
 - E.g., propagate malware, steal users' credentials, track users

- Violate the Chrome Web Store **policies**

- E.g., deceive users, promote unlawful activities, lack a privacy policy

- Contain **vulnerabilities**

- Designed by well-intentioned developers... but contain some vulnerabilities
 - E.g., can lead to user-sensitive data exfiltration

Did you know that...

- **350M users** installed **Security-Noteworthy Extensions** in the last 3 years?
- These dangerous extensions stay in the Chrome Web Store *for years*?
- **60%** of extensions have never received a single update?

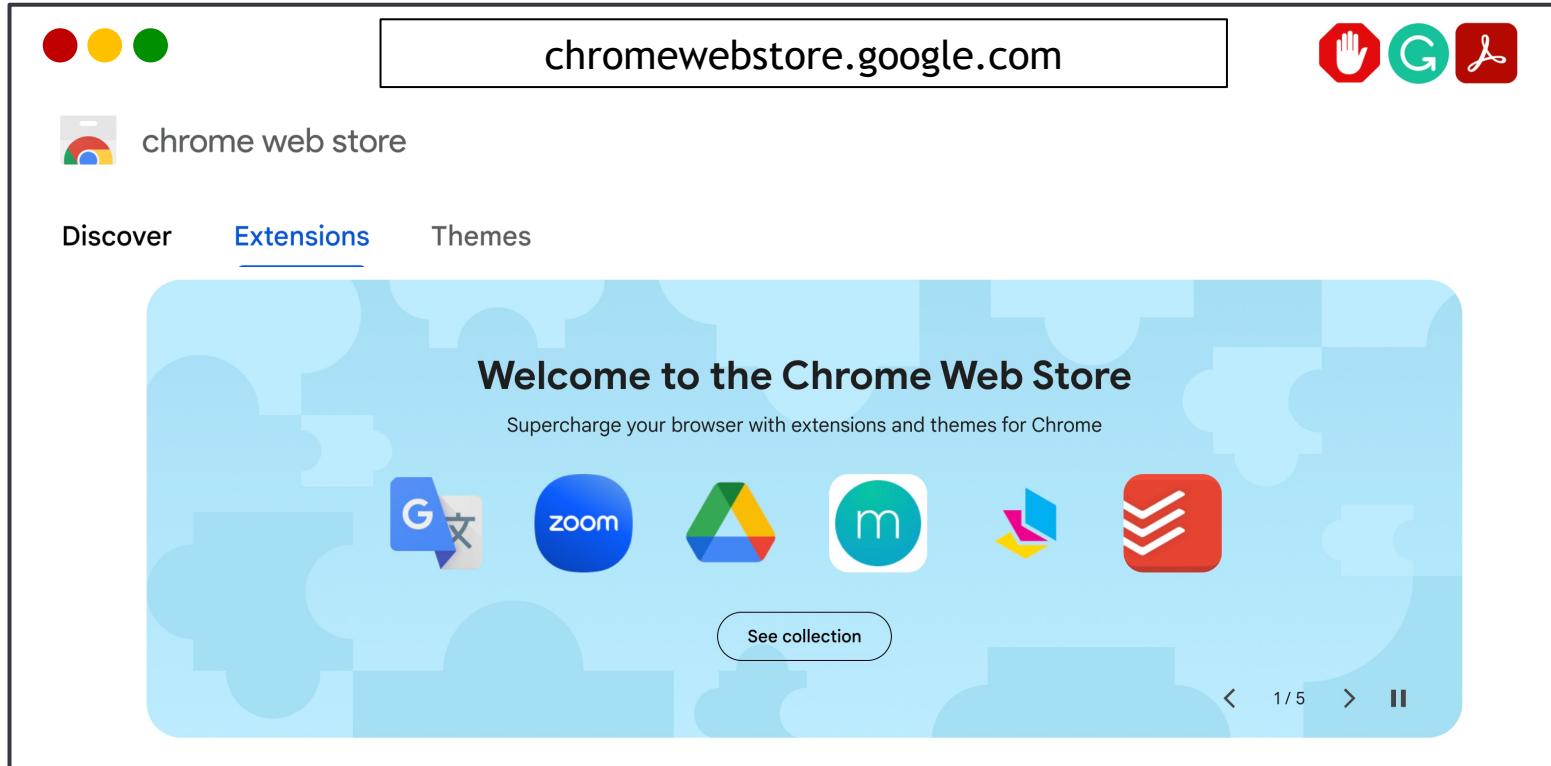


> What is in the Chrome Web Store?



In ACM AsiaCCS 2024. Sheryl Hsu, Manda Tran, and Aurore Fass

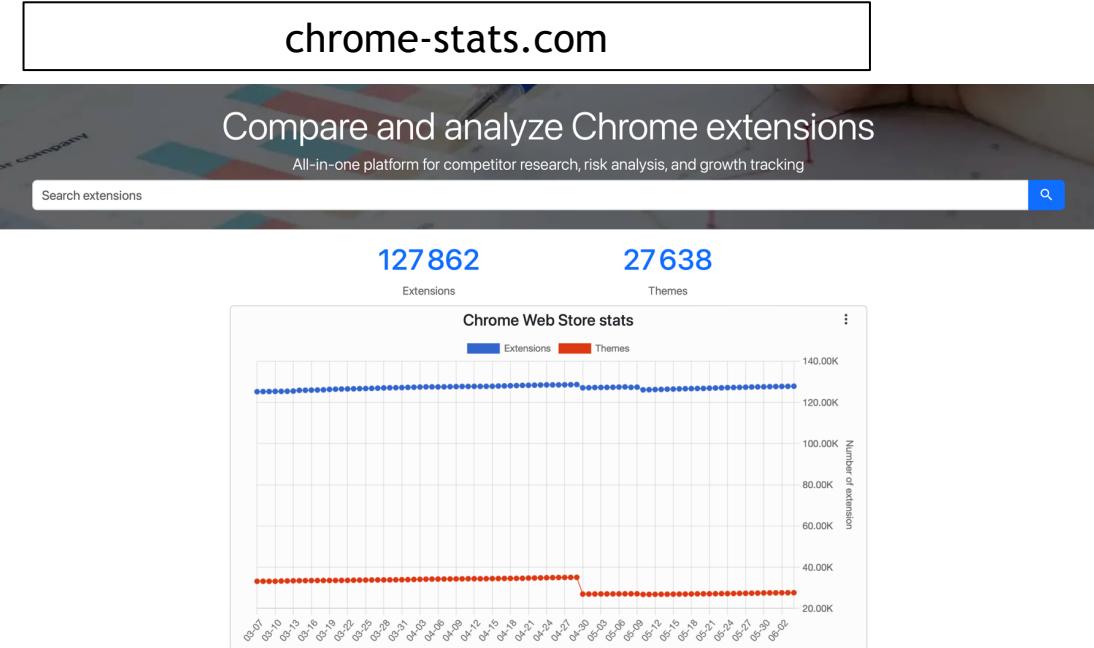
How to Install Extensions or SNE?



How to Install Extensions or SNE?



Browser Extension Collection: Chrome-Stats



The screenshot shows the Chrome-Stats.com homepage. At the top, there's a search bar with the text "chrome-stats.com". Below it is a banner with the heading "Compare and analyze Chrome extensions" and the subtext "All-in-one platform for competitor research, risk analysis, and growth tracking". A search bar is also present here. To the left, there's a sidebar with a red, yellow, and green circular icon at the top. Below it, there's a logo for "Chrome-Stats Premium" and a search bar. The sidebar lists "Recently viewed" extensions: Spotify™ & Deezer™ Music Downloader, GS Auto Clicker:Free Download 2021, Fraud Risk Scoring, Autoskip for Youtube, and Maxi Refresher. Below this is a section for "Stats & analysis tools" with links to "Chrome extension statistics", "Extension explorer", "Keyword explorer", "Publisher explorer", "Advanced search", "Raw data download", and "Chrome-Stats extension".

127862 **27638**

Extensions Themes

Chrome Web Store stats

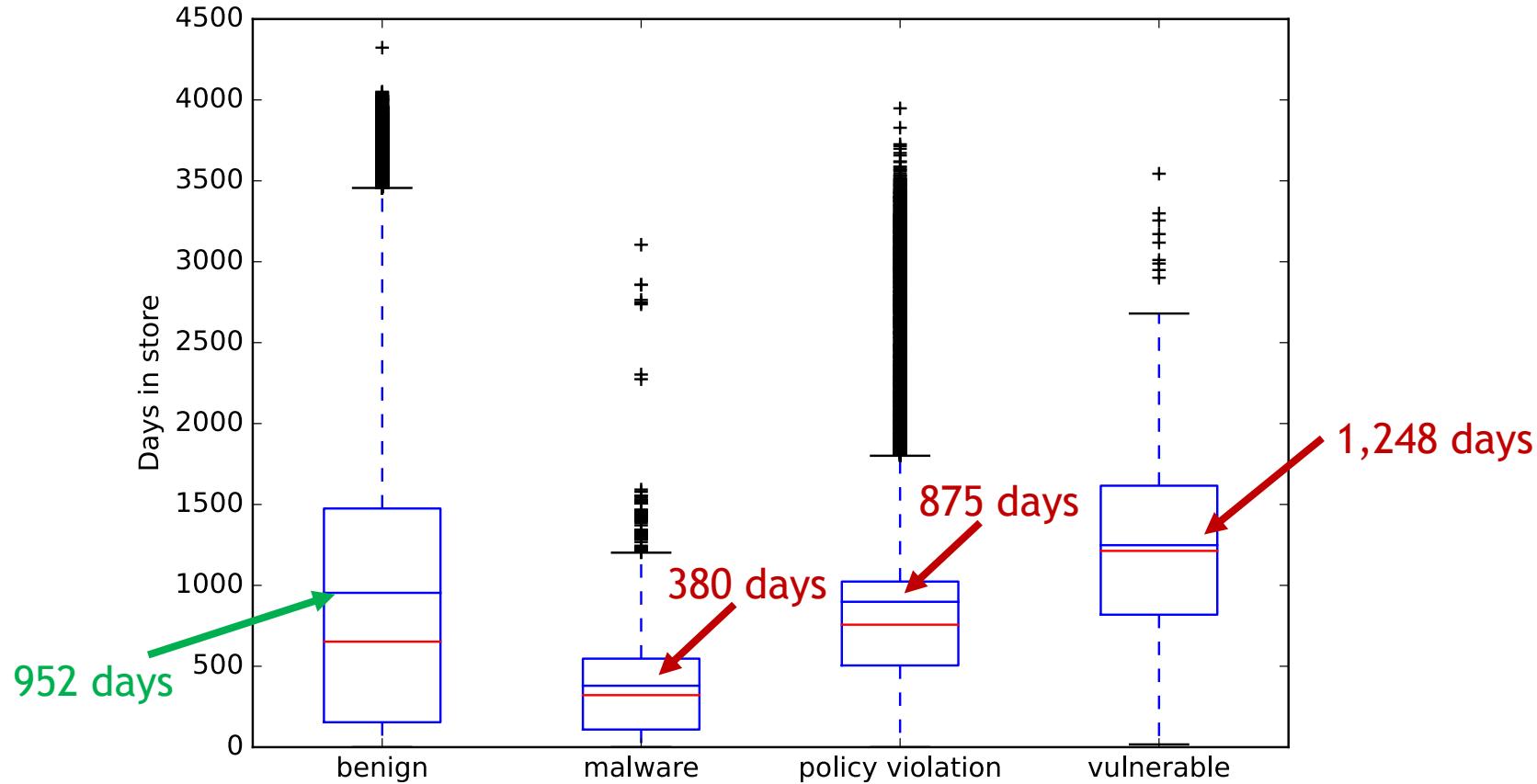
Explore more Chrome extension statistics

Chrome-Stats makes Chrome extension metrics more accessible to everyone, enable competitive analysis, identify bad actors, and help support the growth of good Chrome extensions.

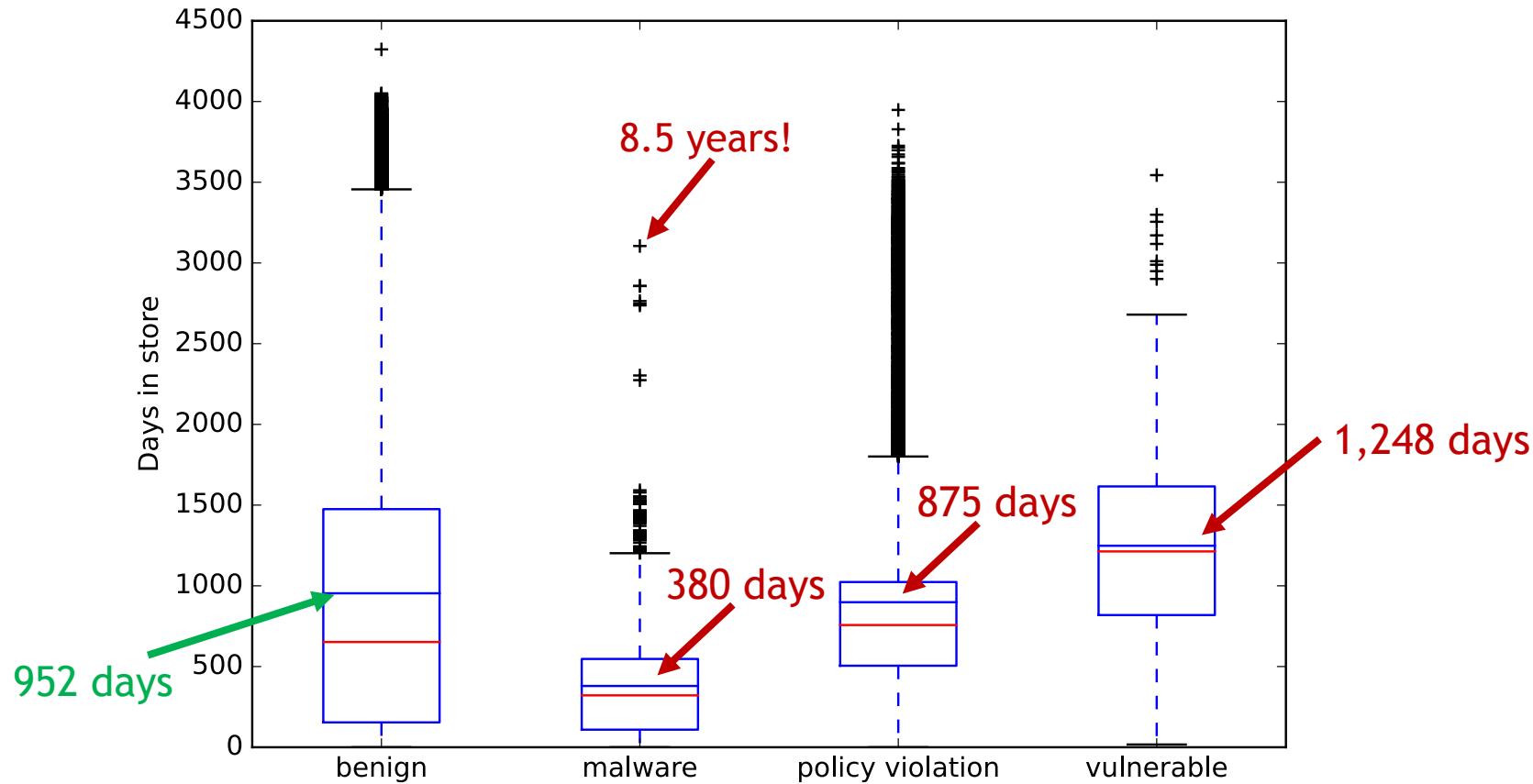
Browser Extension Collection: Chrome-Stats

Category	#Extensions Metadata collected	#Extensions Code collected	When collected
SNE	26,014	16,377	Before May 1, 2023
- Malware-containing	10,426	6,587	Before May 1, 2023
- Policy-violating	15,404	9,638	Before May 1, 2023
- Vulnerable [1]	184	152	March 16, 2021

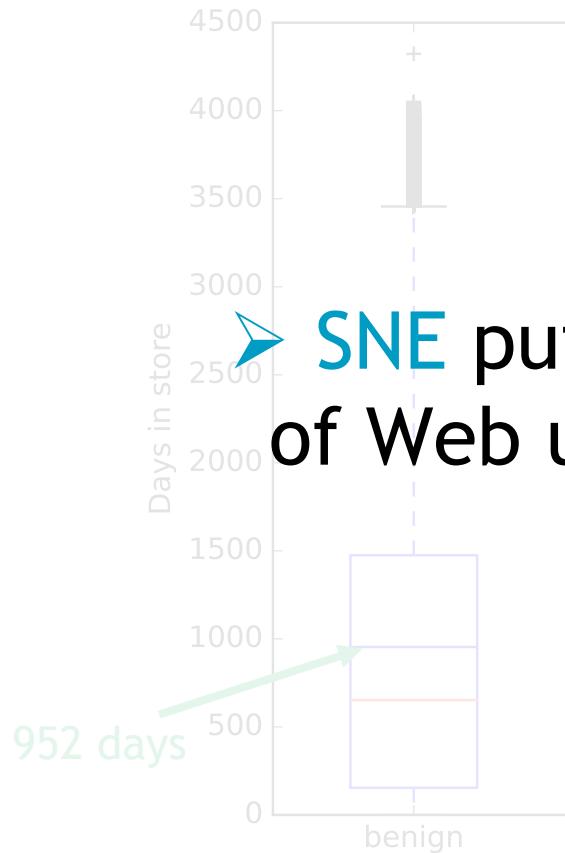
Number of Days in the CWS



Number of Days in the CWS



Number of Days in the CWS

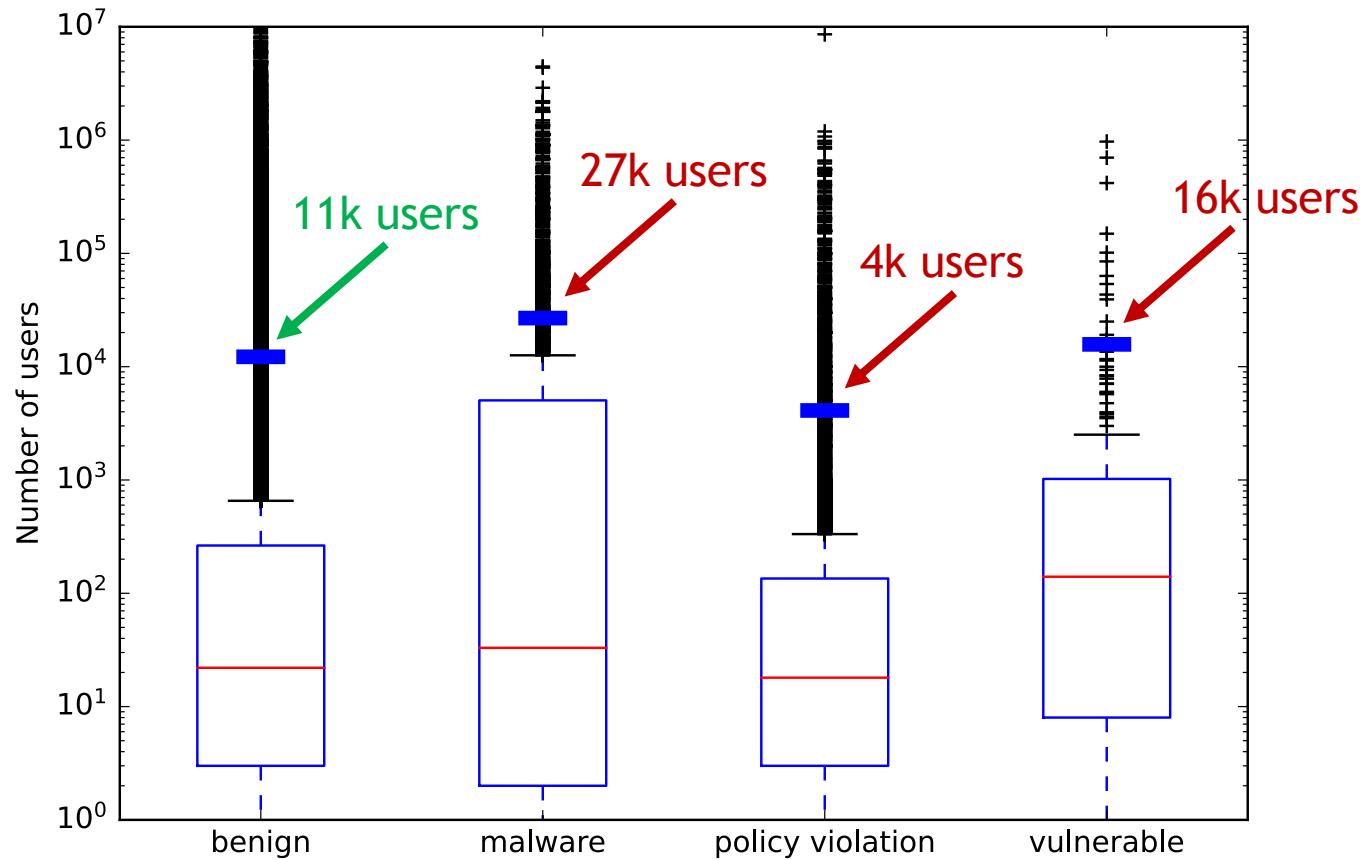


➤ SNE put the security & privacy
of Web users **at risk *for years***

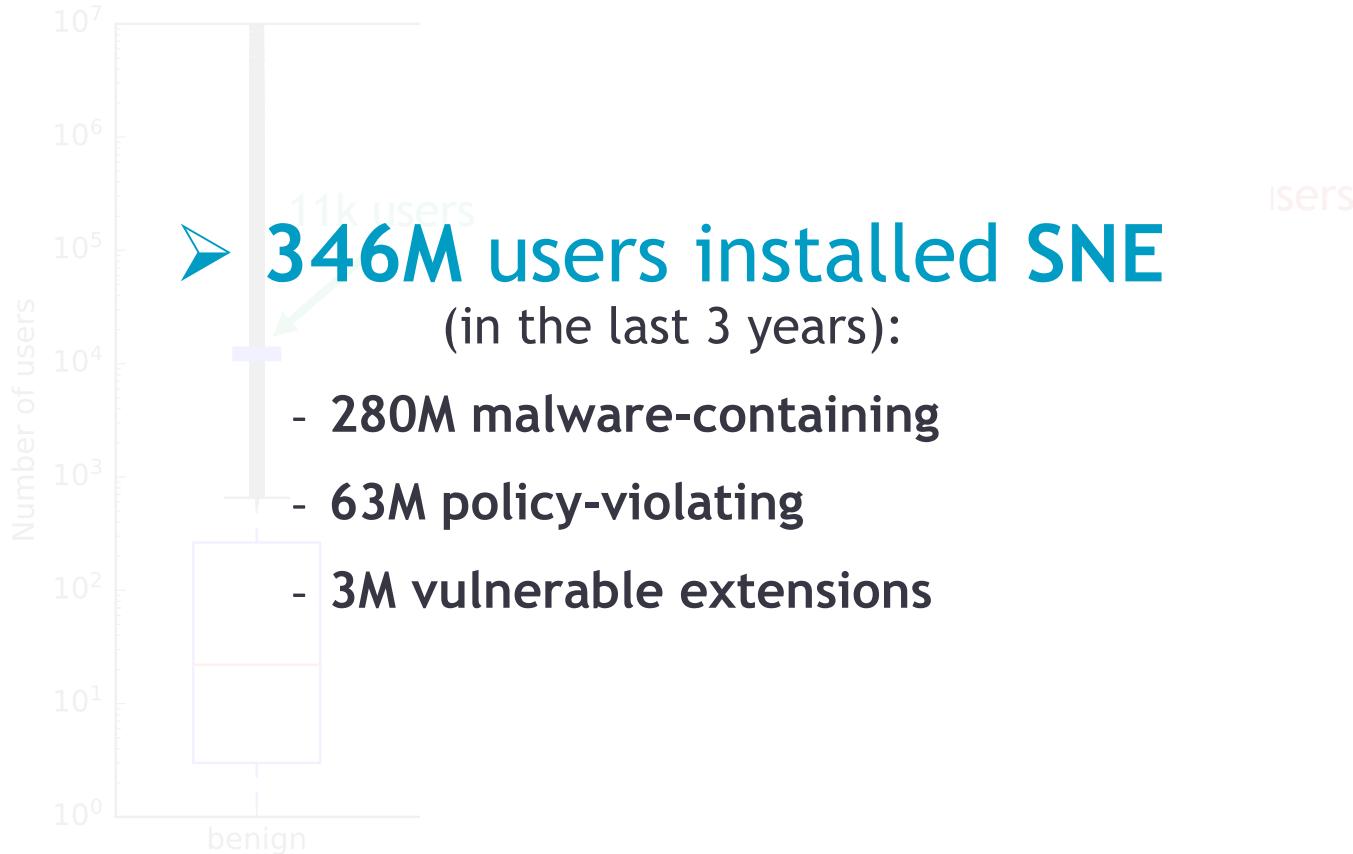
,248 days

952 days

Number of Users



Number of Users



Media Coverage

Forbes

FORBES > INNOVATION > CYBERSECURITY

280 Million Google Chrome Users Installed Dangerous Extensions, Study Says

Davey Winder Senior Contributor 

Davey Winder is a veteran cybersecurity writer, hacker and analyst.

Jun 24, 2024, 06:57am EDT



How safe are Google Chrome extensions? SOPA IMAGES/LIGHTROCKET VIA GETTY IMAGES

The Register®

Risk of installing dodgy extensions from Chrome store way worse than Google's letting on, study suggests

All depends on how you count it – Chocolate Factory claims 1% fail rate

Thomas Claburn

Sun 23 Jun 2024 // 10:36 UTC

 ADGUARD

Subscribe to news  Search blog 

AdGuard > Blog > Google is failing miserably at weeding out bad extensions, new research indicates

Google is failing miserably at weeding out bad extensions, new research indicates

July 5, 2024 · 7 min read

TECHSPOT

TRENDING FEATURES REVIEWS THE BEST DOWNLOADS PRODUCT FINDER FORUMS

SECURITY THE WEB MALWARE CHROME

Researchers say 280 million people have installed malware-infected Chrome extensions in the last 3 years

Google claims less than 1% of all installs include malware

By Rob Thubron June 24, 2024 at 11:39 AM



Takeaways – Browser Extension (In)Security

Browser Extensions are Popular



AdBlock — best ad blocker
Offered by: getadblock.com



Adblock Plus - free ad blocker
Offered by: adblockplus.org



Adobe Acrobat
Offered by: Adobe Inc.



Avast Online Security
Offered by: <https://www.avast.com>



Cisco Webex Extension
Offered by: [webex.com](https://www.webex.com)



Google Translate
Offered by: translate.google.com



Grammarly for Chrome
Offered by: grammarly.com



Honey
Offered by: <https://www.joinhoney.com>



Pinterest Save Button
Offered by: pinterest.com



Skype
Offered by: www.skype.com



uBlock Origin
Offered by: Raymond Hill (gorhill)



LastPass: Free Password Manager
Offered by: LastPass

- 125k Chrome extensions totaling over 1.6B active users

What is in the Chrome Web Store?



Hsu et al.
AsiaCCS
2024

- 350M users installed SNE in the last 3 years
- These SNE stay in the Chrome Web Store *for years*
- Extensions have a **short life cycle** in the CWS (60% stay 1 year)
- Critical **lack of maintenance** in the CWS (60% received no update)

Security-Noteworthy Extensions (SNE)

▪ Contain malware

- Designed by malicious actors to harm victims
- E.g., propagate malware, steal users' credentials, track users

▪ Violate the Chrome Web Store policies

- E.g., deceive users, promote unlawful activities, lack a privacy policy

▪ Contain vulnerabilities

- Designed by well-intentioned developers... but contain some vulnerabilities
- E.g., can lead to user-sensitive data exfiltration

Media Coverage



280 Million Google Chrome Users Installed Dangerous Extensions, Study Says



Risk of installing dodgy extensions from Chrome store way worse than Google's letting on, study suggests

All depends on how you count it – Chocolate Factory claims 1% fail rate

▲ Thomas Claburn

Sun 23 Jun 2024 10:38 UTC

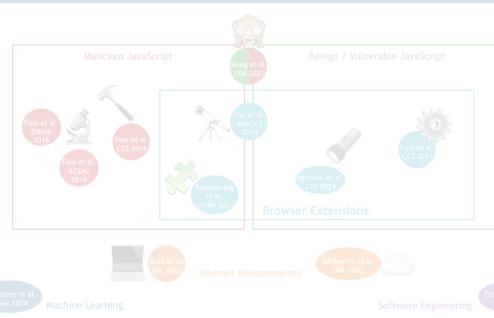


Researchers say 280 million people have installed malware-infected Chrome extensions in the last 3 years

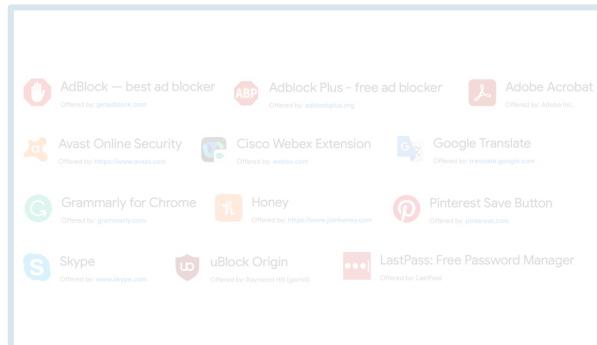
Google claims less than 1% of all installs include malware



Agenda



Research Work

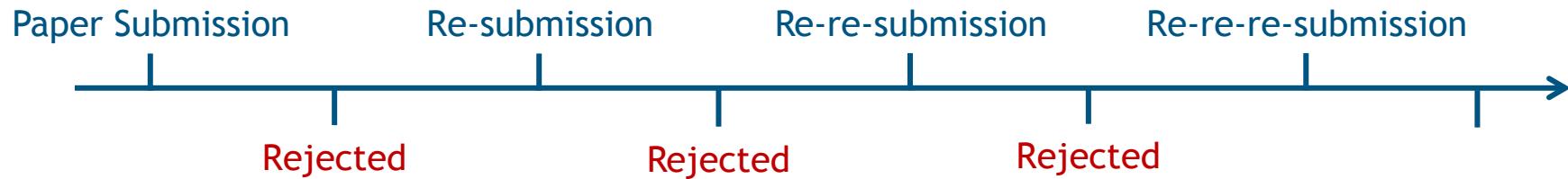


Browser Extensions

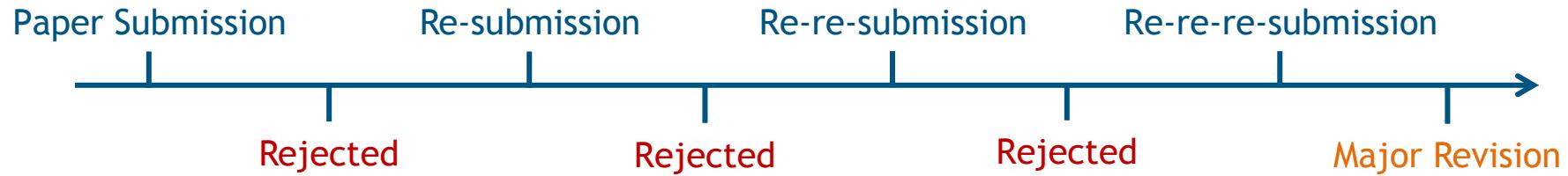
Reviewing



Reviewing Timeline



Reviewing Timeline



How do you Get your Paper Accepted?

- 1) Read the Call for Papers

- 2) Do “good” research

- 3) Write “good” reviews

How do you Get your Paper Accepted?

- 1) Read the Call for Papers

- 2) Do “good” research

- 3) Write “good” reviews

Your Reviewing Experience

- Who has reviewed for major security or ML conferences?
(= read the paper and write the review)
- Who has been in the PC of a major security or ML conference?
- Who has reviewed for a workshop / WinterSchool?

Reviewers' Responsibilities

- Participate in the bidding process
- Provide high-quality, constructive, and timely reviews
- Participate in the discussion
- Update your review/score after reading the authors' rebuttal
- Do the above for all cycles/rounds of the conference

Review Form

- Paper Summary
 - Strengths / main reasons to accept the paper
 - Weaknesses / main reasons to reject the paper
 - Comments for authors
- Objectively evaluate the scientific contribution
≠ describe one's subjective opinion

Content of “Comments for Authors”

- Comment on the following aspects:
 - Paper’s motivation
 - Overall presentation
 - Technical contribution
 - Experimental evaluation
 - Related work
- Organize your review (sections) and start with the “biggest issues”
- Be specific
- Be constructive

Example

- Weaknesses:

! Out of scope

- Comments for authors:

Example

- Weaknesses:

~~! Out of scope~~

- This paper is written mostly from a measurement perspective, and the security implications are not clear to me

- Comments for authors:

Example

- Weaknesses:

~~! Out of scope~~

- This paper is written mostly from a measurement perspective, and the security implications are not clear to me

- Comments for authors:

[...]

Unclear security implications

Example

- Weaknesses:

~~! Out of scope~~

- This paper is written mostly from a measurement perspective, and the security implications are not clear to me

- Comments for authors:

[...]

Unclear security implications

This paper is mostly a measurement study of the CWS and would be a better fit for a measurement conference like IMC. It would benefit the paper to clearly highlight the takeaways and security implications of this paper.

Example: Vague Claim

! The motivation of the paper is weak

Example: Vague Claim

~~! The motivation of the paper is weak~~

- Unclear what the problem is: the *way* the paper is motivated or the *problem* the authors focus on

Example: Vague Claim

~~The motivation of the paper is weak~~

- Unclear what the problem is: the *way* the paper is motivated or the *problem* the authors focus on
- It would benefit the paper to further discuss the motivation for this work. For example, what is the added value of this paper compared to [X, Y, Z]? The motivation could also be improved by presenting some real-world case studies.

Example: Vague Claim

! Lack of novelty: presence of dangerous extensions in the CWS is well known

Example: Vague Claim

~~! Lack of novelty: presence of dangerous extensions in the CWS is well known~~

- Vague and unsubstantiated: provide citations to papers which undermine the novelty of this one

Example: Vague Claim

~~! Lack of novelty: presence of dangerous extensions in the CWS is well known~~

- Vague and unsubstantiated: provide citations to papers which undermine the novelty of this one

! This work is very similar to [X].

Example: Vague Claim

~~! Lack of novelty: presence of dangerous extensions in the CWS is well known~~

- Vague and unsubstantiated: provide citations to papers which undermine the novelty of this one

~~! This work is very similar to [X].~~

- This paper discusses [X], but the authors do not explain why [X] cannot be applied in this setting nor what the added value of their approach is compared to [X].

Time to Review a Paper

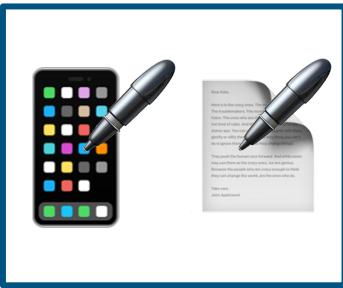
- At the beginning (2nd and 3rd year PhD student), takes forever (1–2 days!)

- Now:
 - 1.5 hours to read a paper (13 pages, double column)
 - 1.5–2 hours to write a review

Aurore's Recipe: What do you Need for Reviewing?



Be comfy!



Annotate
easily



NO
distraction



TIME

Aurore's Recipe: My “Reviewing Approach”

- 1) Read the paper + annotate the PDF
- 2) Write the review (possibly on another day)
 - + have a look at the source code
 - + double check some unclear points
 - + check for related work
- 3) Proofread and improve the review (**definitely** on another day)
- 4) Submit the review

Aurore's Recipe: My “Reviewing Approach” Cont'd

- Read the other reviews
- (Optional) rate others' reviews

Review ratings (anonymous reviewer feedback)

Good review

Needs work

Too short

Too vague

Too narrow

Disrespectful

Not correct

Aurore's Recipe: My “Reviewing Approach” Cont’d

- Read the other reviews
- (Optional) rate others' reviews

Review ratings (anonymous reviewer feedback)

Good review

Needs work

Too short

Too vague

Too narrow

Disrespectful

Not correct

▼ [Your Reviews](#) · [Offline reviewing](#) · [Review preferences](#)

Your reviews have received [5 positive ratings](#).

Aurore's Recipe: My “Reviewing Approach” Cont'd

- Read the other reviews
- (Optional) rate others' reviews

Review ratings (anonymous reviewer feedback)

Good review

Needs work

Too short

Too vague

Too narrow

Disrespectful

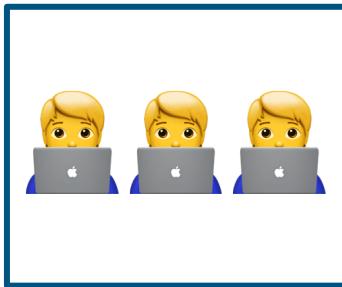
Not correct

- Actively participate in the discussion
- Read the authors' rebuttal
- Update my review (and maybe my score) after reading the rebuttal
- In case of a revision, propose some revision criteria

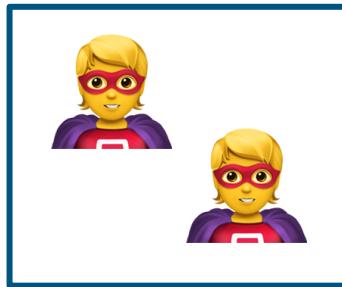
Who Will be Reading your Review?



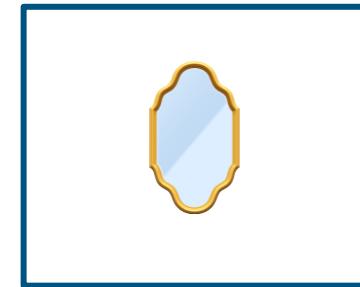
Authors



Other
reviewers



PC / track
chairs



YOU

- Objective of reviews:
 - Encourage and help the authors to produce a better work, independently of the reviewers' recommendation
 - Help the PC / track chairs reach a decision

Takeaways – Reviewing

Reviewers' Responsibilities

- Participate in the bidding process
- Provide high-quality, constructive, and timely reviews
- Participate in the discussion
- Update your review/score after reading the authors' rebuttal
- Do the above for all cycles/rounds of the conference

Aurore's Recipe: What do you Need for Reviewing?



Be comfy!



Annotate
easily



NO
distraction



TIME

Content of “Comments for Authors”

- Comment on the following aspects:
 - Paper's motivation
 - Overall presentation
 - Technical contribution
 - Experimental evaluation
 - Related work
- Organize your review (sections) and start with the “biggest issues”
- Be specific
- Be constructive

Aurore's Recipe: “My Reviewing Approach”

- 1) Read the paper + annotate the PDF
- 2) Write the review (possibly on another day)
 - + have a look at the source code
 - + double check some unclear points
 - + check for related work
- 3) Proofread and improve the review (definitely on another day)
- 4) Submit the review



fass@cispa.de



<https://aurore54f.github.io>



@AuroreFass