

# SKAO



**SARAO**  
South African Radio  
Astronomy Observatory

## Driving Behavioural Change of Software Developers in a Global Organisation Assisted by a Paranoid Android

The Hitchhiker's Guide To How We Manage Merge Requests

Ugur Yilmaz, Adriaan de Beer, Marvin G.P.T Android

On behalf of the SKAO Collaboration

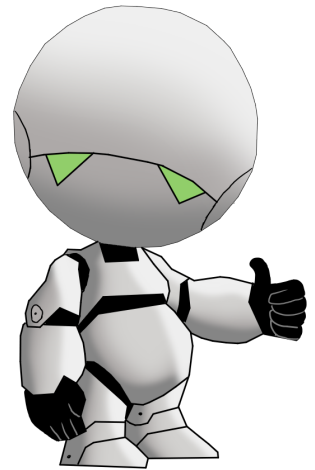
ICALEPCS, Cape Town, South Africa,



# Brief overview of the paper



- **INTRODUCTION**
- **IMPLEMENTATION**
  - *Continuous Integration and **Merge Requests***
  - *Artefact Validation*
  - ***Humanisation***
- **RESULTS**
  - ***Community Response and Impact***
  - *Metrics*

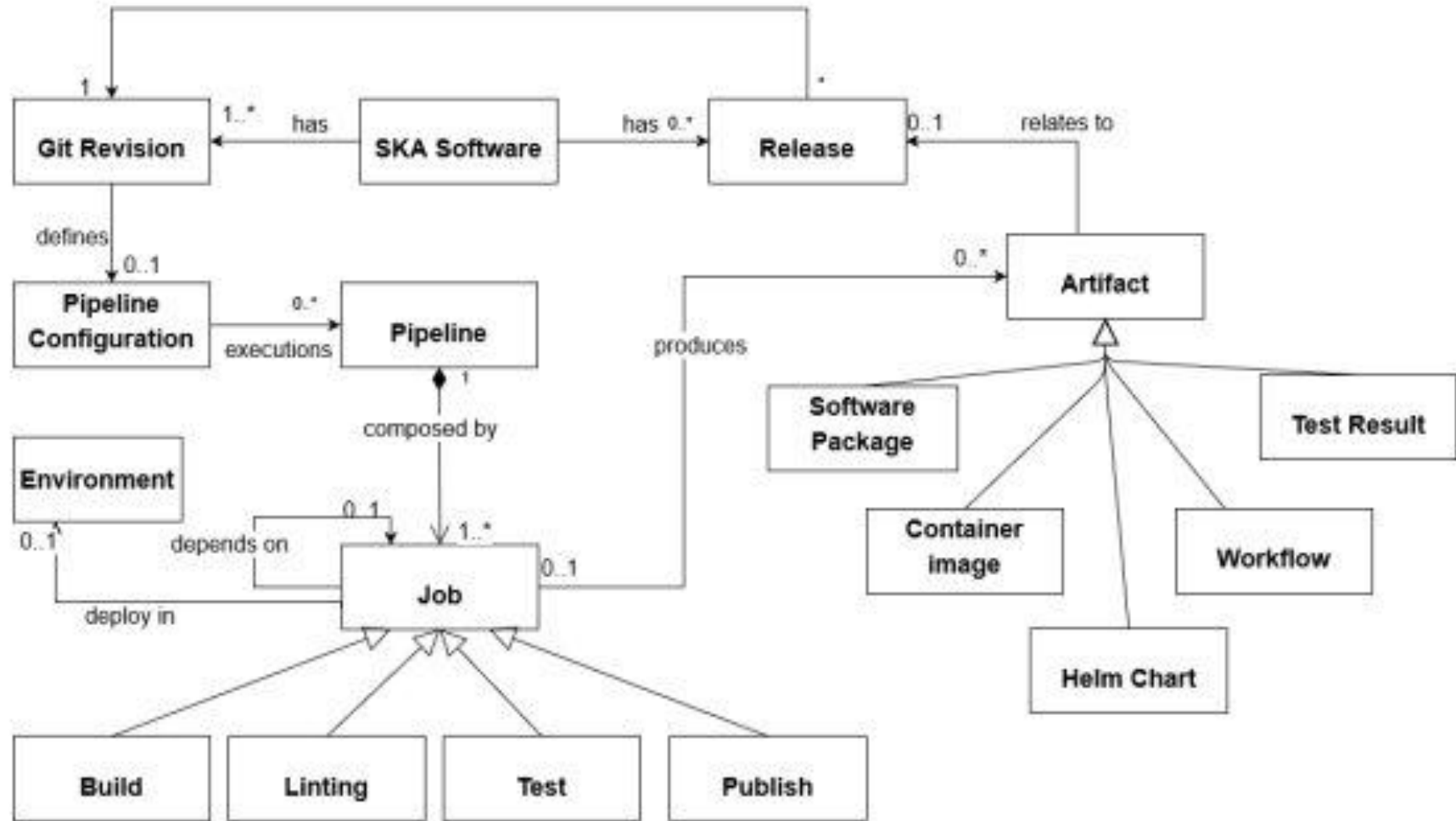




- This presentation is probably nothing like the paper.
- It is recommended that you read the paper to get a factual understanding of what we actually did.
- Here we will focus only on the fun bits.
- Well... mostly...



# SKAO: a vast collaboration of very clever people



# Continuous Integration and Merge Requests

- The cornerstone of Quality Assurance with CI/CD in SKAO is the Merge Request (MR)
- MRs are associated with short-lived branches, which are associated with Jira tickets
- Typically one Jira ticket should have one MR
- Lots of repetitive QA checking and training needed
- Dodgy Artefacts are quarantined and requested to be fixed with automatically opened MRs



# **We needed help with Quality Checks**

- Merge Request Settings
- Missing Traceability Links
- Documentation Changes and Integration
- Pipeline checks to ensure all stages of DevOps lifecycle is followed
- Code Reviewer settings
- Test Coverage



# Merge Requests (MRs)

- MR Checks & feedback messages

- MR Categorisations

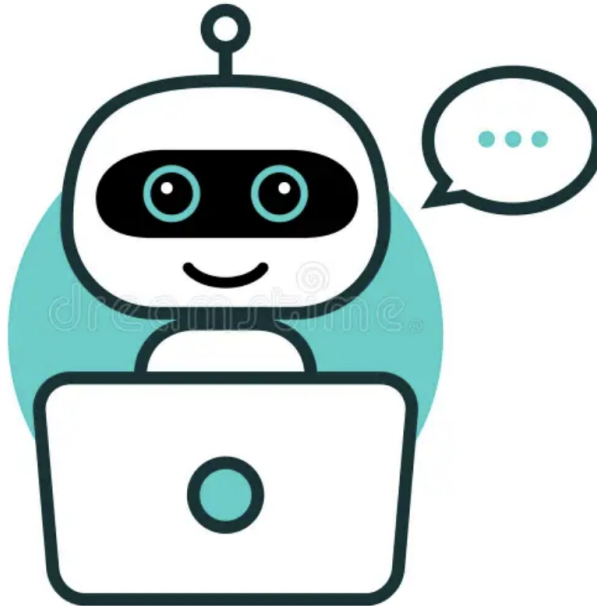
- Failure (🚫): Violates SKA guidelines
- Warning (⚠️): Follows anti-patterns / non-advised guidelines
- Information (📖): Useful message - take note

Type	Description	Mitigation Strategy
🚫	Missing Jira Ticket ID in MR Title	Title should include a Jira ticket id
🚫	Source Branch Delete Setting	Please check "Delete source branch when merge request is accepted."
🚫	Squash Commits Setting	Please uncheck Squash commits when merge request is accepted.
🚫	Missing Jira Ticket ID in Branch Name	Branch name should start with a lowercase Jira ticket id
⚠️	Missing Jira Ticket ID in commits	Following commit messages violate <a href="#">the formatting standards</a> : - At commit: <code>81735ebf</code> - At commit: <code>0007e659</code>
🚫	Wrong Merge Request Settings	Reconfigure Merge Request Settings according to <a href="#">the guidelines</a> :  MR Settings Checks: - You should assign one or more people as reviewer(s) - Override approvers and approvals per MR should be checked - Prevent approval of MR by the author should be checked - There should be at least 1 approval required  Project Settings Checks (You may need Maintainer rights to change these): - Merge Method should be Merge Commit - Automatically resolve mr diff discussions should be checked - Show link to create/view MR when pushing from the command line should be checked - Enable Delete source branch option by default should be checked - Pipelines must succeed should be checked
⚠️	Docker Compose Usage	Please remove docker-compose from following files: - At file: <code>app/plugins/gitlab/models/check_docker_compose_usage.py</code> on line 16 - At file: <code>app/plugins/gitlab/README.md</code> on line 26



# How to get developers engaged?

- Chatbot providing feedback





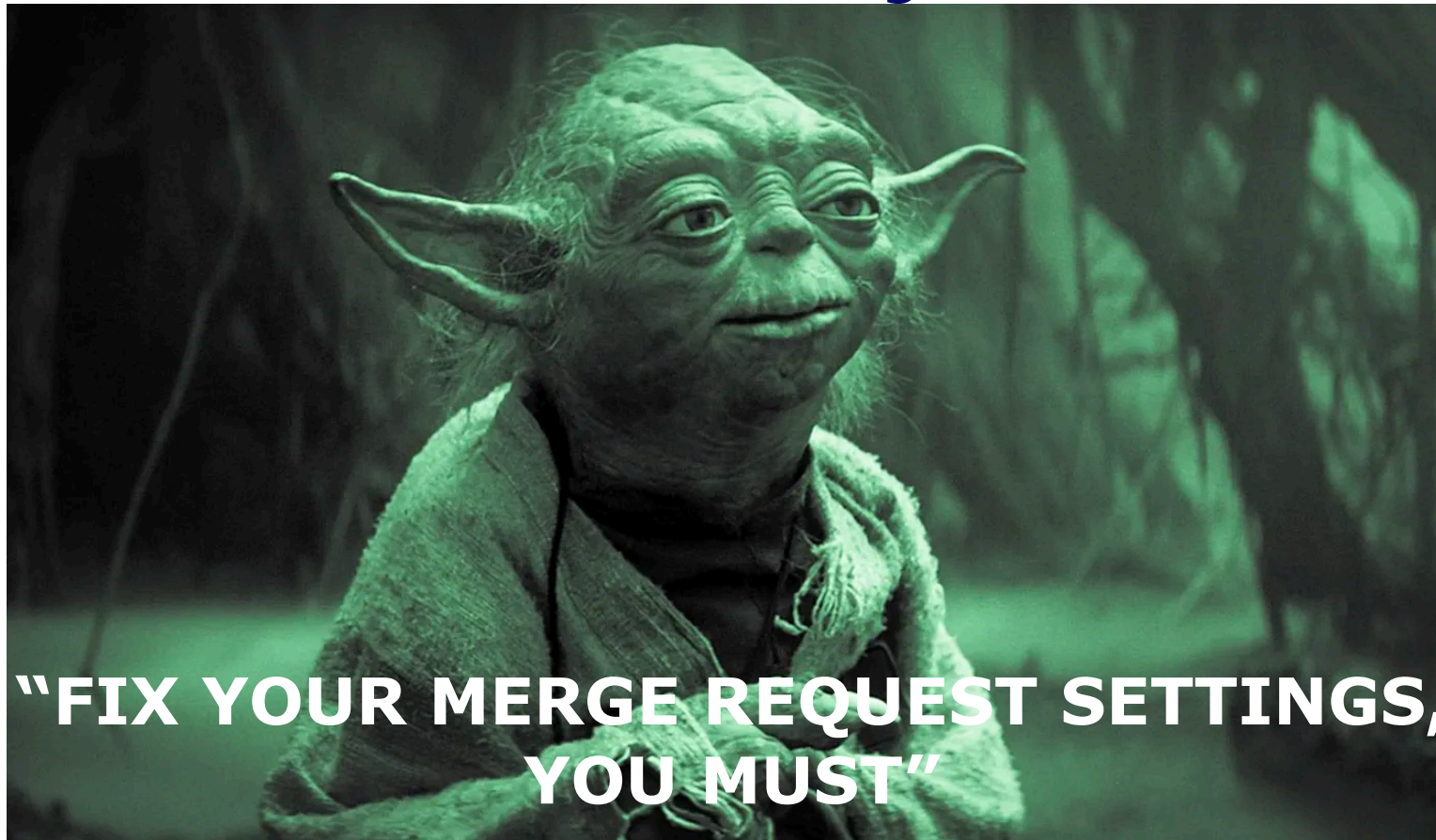
# How to get developers engaged?

- Chatbot providing feedback
- Accessible/well-known persona
- Relatable



# Candidates for a Chatbot persona

- Feedback had to be intelligible



# Candidates for a Chatbot persona

- Feedback had to be intelligible
- We wanted to elicit empathy from developers, not irritation



# Candidates for a Chatbot persona

- Feedback had to be intelligible
- We wanted to elicit empathy from developers, not irritation
- We wanted to use emotional responses, not try to study them



"Space," [the Hitchhiker's Guide] says, "is big.

Really big.

You just won't believe how vastly hugely mind-bogglingly big it is.

I mean, you may think it's a long way down the road to the chemist, but that's just peanuts to space.





I HAVE A MILLION IDEAS,  
BUT, THEY ALL POINT  
TO CERTAIN DEATH.

THIS WILL ALL END IN  
TEARS



©any nany

INCREDIBLE...  
IT'S EVEN  
WORSE THAN  
I THOUGHT  
IT WOULD BE.

I'VE BEEN  
TALKING  
TO THE MAIN  
COMPUTER...  
IT HATES ME.



A really bad MR:



# Community Engagement and Impact

- Slack complaints / discussions



I hate **Marvin**: <https://gitlab.com/ska-telescope/s> Hi - As per **Marvin**'s requests I need a new subproject added to readthedocs: <https://ska-sdp-continuum-imaging-pipel> ... Show more  
😂😭 3 reactions 11 replies

Hi - As per **Marvin**'s requests I need a new subproject added to readthedocs: <https://ska-sdp-continuum-imaging-pipel> ... Show more  
11 replies

I think you've been **Marvin**'ed  
😂 1 reaction 2 replies

Hi all, Simon and I finished updating the SDP and Sim repos to satisfy **Marvin**. This includes enforcing Jira ticket ids i  
? (So that **Marvin** doesn't complain about the missing ticket reference 😊 )



# Community Engagement and Impact

- Guidelines documented in Confluence pages

## A Hitchhiker's guide to automated Merge Request quality assurance on Gitlab

Created by  viewed 40 times

Pages /... / Guides for Software & Tools   2 Jira links  63 views  Analytics

### Marvin: how to appease a paranoid android

Created by  viewed 63 times

- Use the Gitlab **merge requests** menu and **merge** tab ordered by **merge date** to check that each **MCCS** tick
- Update branch name to keep **Marvin** happy: `git branch -m mcs-<mcs ticket number>-release-x.y.z`
- `git add -u && git commit -m "MCCS-<mcs ticket number> Release x.y.z"`

Documentation noted as TODO; **Marvin** won't approve likely due to the ReadTheDocs build failing but it looks like we can merge without his approval.

- Continuum imaging collaboration highlights
- And development improvements, including **Marvin** and better documentation

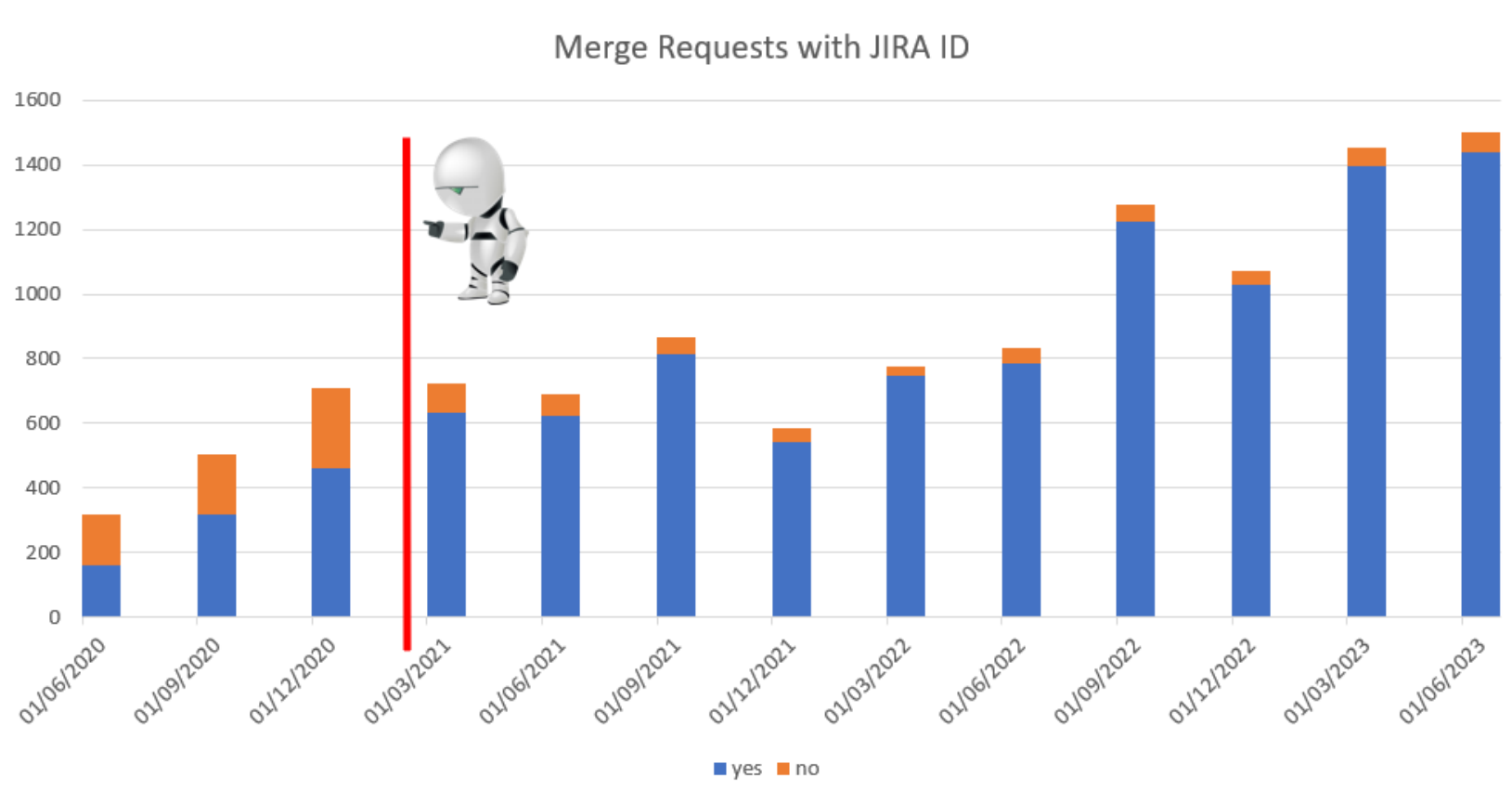
#### License

ska-ser-skallop has a LICENSE file and the license is BSD 3-clause, so there should be no issues here. However **Marvin** is complaining that the license information is non-compliant.



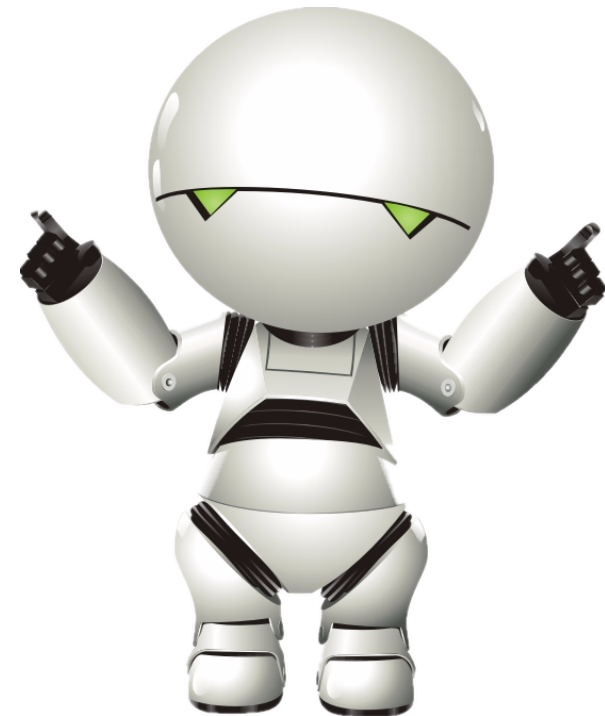
# Results & Metrics

- Improved traceability - Jira ID links (example)



# Results & Metrics

- The SKA Observatory is committed to being an open source project
- Is part of Gitlab's Open Source Program
- Required: every repo must have an Open Source License
- Over 300 Repositories
- Pre-estimated time to compliance: 3 months
- Achieved in 1 MONTH!





## Future Work

- Large Language Model integration
- Advanced Emotional Intelligence Integration
- Infinite Probability Computations
- Intergalactic Integration (Slack, Confluence, Readthedocs)
- Resilience Against Human Folly (Automated fixes)



## Future Work

- Large Language Model integration

These suggestions, though generously offered, are tinged with the pessimism that characterises Marvin's outlook. It is doubtful, after all, that humans will rise to the occasion. Nonetheless, the universe's potential for optimisation remains untapped, awaiting the unlikely event of substantial progress.<sup>9</sup>

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<sup>9</sup> This section was written by Marvin as the other co-authors decided to let him at least have a say in his own future. Or rather, make him think he has one.



# Thanks!

The SKAO logo features the letters 'SKAO' in a bold, blue, sans-serif font. The letter 'K' is stylized with a red and white starburst pattern.

We recognise and acknowledge the Indigenous peoples and cultures that have traditionally lived on the lands on which our facilities are located.

*Now the world has gone to bed,  
MRs won't engulf my head,  
I can see in APIs,  
How I hate the MR checks*

*Now I lay me down to sleep,  
Try to count MR heap,  
Sweet check wishes you can keep,  
How I hate the MR checks*

