Xer Name: Ammar Husain
Job Title: Software Engineer
Manager Name: Joerg Mueller
Level: 5

Manager Assessment

Complete this form at least 72 hours prior to your calibration session so that other managers can review your notes ahead of time. We recommend that you meet with Ammar ahead of the calibration session to align on their past performance and expectations. After your calibration session, it is your responsibility as a manager to update this assessment based on feedback from the calibration session. The final result ***(both the rating and your manager assessment notes)*** *will be released to your direct report at the end of the cycle.*

Assign a rating for your direct report based on the past 12 months. Visit go/xperf-ratings for more information.

Rating

3 - Company Rating - Awarded to the majority of Xers to reflect our collective company success in navigating this challenging time. Most Xers will land here.

Calibration Notes
Visible to: Ammar, Ammar's reporting chain, calibration members, promo decision makers

Why not lower:

- Ammar is making highly impactful contributions to Perception and Proxy. He initiated and ran the navigation triage process and scenario evaluation, enabled and guided CO members to efficiently perform previous SWE tasks, and made the process accessible Proxy-wide. He furthermore is in a coordinating role in WFOV bringup and panoptic segmentation with broad collaboration and high system integration complexity.
- Ammar demonstrated direct leadership of TVCs and collaborated across teams with CO, system, simulation, and motion.
- Ammar landed highly complex IC work with great interface design and high software quality. His libraries reduce chaos and complexity and were widely adopted.

Why not higher:

- Ammar could further increase his impact in collaborations. While he is doing great at communicating goals and objectives as well as aligning on solutions, he could more effectively parallelize efforts and better get people's buy-in and contribution without a formal top-down assignment.

Respect@X: Were there any flags relating to Respect in this Xer's performance review this cycle (please pull forward any flags from your review as well as their peer reviews)?
*Visible to: manager, calibration members, promo decision makers**

No

Self Assessment

Visible to: Joerg Mueller, calibration members, promo decision makers

1. The What: Please list your three main achievements and the impact it had.

Navigation Field Triage

- Demonstrated initiative and provided technical leadership, from **conception** **to** **production**, by kicking off an initially ambiguous but eventually fruitful collaboration. This established a procedural flywheel for addressing incidents & collecting navigation field statistics.
- Persistently pitched the idea of a principled process conducive to scaling up **10X robot hours while capturing** **100X field data** to leadership. Worked with michellecrum@ to recruit a triage champion.
- Created a **living** **triage protocol** **, taxonomy for** **categorizing incidents** **and trained mitri@**.
- Process enabled a better **understanding of robot capability limitations** and **early spotting of system regressions** as is evident in b/150867120, b/150718120. Field incidents are now being **addressed & logged** **within 48 hours** (b/151157855, b/151152320, b/150629177, b/150118175), compared with last year when the majority were never being probed.
- Shifted engineering mindset within navigation from **reactive to proactive mode,** eg: leveraging field experience in designing scenario evaluation use cases to **build guard rails against potential future regressions.**
- Led & guided the protocol for field data aggregation (owner: mitri@) and the design of a dashboard (owner: siranlee@) for ongoing monitoring
- **Proactively & consistently engaging** with the Tools (jrundquist@, jalawrence@, istorz@, ethanlook@) and Data Pipeline (sarahcoe@, justinvf@) teams to **influence the design & requirements** for Viz-MkII, Log Access & Revisualization pipelines.
  - While a competent & well trained triage champion has already reduced triage times from 80 mins -> 50 mins/ bug, I am steering toward an internal collaborative milestone to **bring down navigation triage times 10X** (50 mins -> 5 mins / bug).

- Created a retrospective of lessons learned and key outcomes which I **presented at Proxy TownHall**. Currently helping expand triage purview beyond navigation (eg: HiFi mapping) and advising on similar process setups which are now being considered for other robot capabilities.

message_sync Library

- Interviewed several stakeholders to collect their use cases, researched several solutions and made several judgment calls to create a design that **balanced feature richness with system complexity.** Gathered peer feedback through a design doc and presented it at SW Design Review.
- **Fully owned & implemented the library** in its entirety. Added exhaustive unit test coverage for not only the runtime checks but also compile test assertions of the library.
- message_sync **eliminated the need to write** **boiler plate & potentially bug-ridden** **synchronization logic** and reduces module statefulness. Additionally it promotes memory hygiene through its heavy adoption of Active & WeakMsgPtr.
- Deprecated the usage of: message_synchronizer, TransformSyncBuffer & AsyncTransformSyncBuffer by providing a unified yet powerful interface.
- Proactively augmented it to support the upcoming Reliable IPC (developed by dallison@) by providing a convenient API to bind multiple subscribers with a publisher.
- Evangelized the adoption of the library through hands on migrations, 1:1 trainings and extensive documentation in a **Proxy-TotW#9** which led to its usage in **>20 system modules** and growing.

Scenario Evaluations

- Extended Perception Scenario Evaluations to work beyond just the WorldStateProto. **Leveraged software design & C++ expertise** to redesign the Evaluator to a CRTP class that can be polymorphically specialized for different messages. This reduces code duplication by dispatching to multiple specialized evaluators in a unified module through variant visitation while reusing metrics computations & scenario definitions.
  - Implemented an evaluator for the navigation perception occupancy grid that checks system produced outputs on free, occupied & unknown regions against several user defined assertion polygons on expected results. luting@ is in the process of further extending it for tracking use-cases.

- **Set the agenda for the design & creation of scenarios** by providing technical insights & hands on training to gsiganevich@, okulik@ and mitri@ as well as help procuring necessary access and hardware.
- **Improvised/adapted to the WFH situation** by temporarily shifting focus and engaging with simulation to collect the requisite logs in diverse scenarios, thereby continually making progress. Between Q2 & Q3'20, 20 navigation specific scenario evaluations have been added to guitar and growing continuously. (camera stereo?).
- **Supervised (ranging from vision setting to hands on debugging)** mitri@ chaos reduction by consolidating multiple different ways that all (object detection,navigation) tests were invoked, each with their unique set of arguments, into a configurable unified script. Additionally enabled a **1-click** **debugging workflow** for failing scenario tests that reduced debugging times from ~1h to <10 mins. (I presented this at **TOCC**).
- **Supervised** gsiganevich@ & okulik@ in creating metrics dashboards for continuous monitoring.

WFOV camera integration

- **Implemented the processing** (debayering, HDRNet, JPEG compression, color correction, logging etc) of raw images from the new WFOV cameras on MetA. Collaborated cross functionally with ctalbott@, hiuyu@, fbriggs@, satat@, olast@ to unblock dependencies for deployment.

- **Drove the simulation data generation WFOV images (alongside danielho@, tigrang@)** by quickly getting up to speed on the rendering pipeline, testing distortion models and setting up nightlies.
- **Produced preliminary inference results** for instance segmentation on WFOV images. Rapidly learned Proxy/Google's ML infrastructure as related to bootstrapping models, training & evaluations through several rounds of experimentation.
- Set the strategic vision (with mquinlan@, joergm@) for incorporating panoptic WFOV segmentation from annotations and training to on-robot use cases.

Citizenship

- Participated in ProxyGreatCodeMigration by migrating ~14k lines of code, and reviewing another ~24k.
- Discovered an issue in log playback that caused infinite recursions with subscribing/publishing transforms. Implemented a fix, corresponding tests and a best practices Proxy-TotW#5.
- Ran into issues with missing CodeSearch cross references in camera stereo code caused due to indexing builds that were failing for over a year. Worked with the Google3-Grok team on a solution that they eventually used for their documentation.
- Obtained C++ readability.

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2. How

While all of the X Values and Principles carry equal weight on how Xers are expected to show up and what is believed to give X the best possible chance at winning the long game, we believe there are four Values/Principles that were especially important this year as we faced an unprecedented time.

Please provide how you believe you performed against the following. If there's another Value/Principle that you want to highlight in addition to these four, please choose from the drop down.

Consistently strong contributor - I always demonstrate this Value/Principle
Solid contributor - I often demonstrate this Value/Principle

Teamwork

Solid contributor

Initiative

Consistently strong contributor

Dispassionately Assess

Solid contributor

Shift Perspective

Solid contributor

Other: Learning

Consistently strong contributor

If you selected "Consistently strong contributor" to any of the above, please provide additional context/specific examples.

Initiative:

I found an opportunity for a 10X process improvement in navigation field operations and authored the Navigation Field Triage Doctrine on my train commute to/from work. I incessantly pitched for it which led us in being able to recruit a triage champion, execute on the flywheel and correspondingly design appropriate tooling to make the problem more manageable. Training & enabling the triage champion took a significant amount of time & energy, however, he is now a force multiplier. I followed up with a retrospective on my learning & outcomes of this experiment, which has now become an established process. Finally I pitched this Proxy wide during the August TownHall .

Learning :

Over the last 2 quarters I have had to ramp up on several new parts of the Proxy SW stack such as scenario evaluation, low level camera pipeline, simulation data generation, perception model training as well as on-robot inference. By leveraging my previous experiences along with finding the right set of mentors and investing focused time for hands on experimentation, I have managed to balance learning while continuing to make active contributions. Given the growing need for adding more semantics and learning based capabilities to navigation perception, I am ramping up to build familiarity with the object properties software stack end to end, from data generation/annotation & model training to on-robot inference.

Not enough responses to display