

## 2021 Q3 Performance Evaluation

**Employee Name** Ammar Husain  
**Job Title** Senior Software Engineer

**Manager Name** Joerg Mueller  
**Level** 5

### Self Assessment

Ensure any documentation/resources linked are silently shared with [proxy-perf-help@google.com](mailto:proxy-perf-help@google.com).

#### The What:

##### Spearheading Learning based Navigation Perception (Navigation Perception v2)

Robots drove an [average of 9.5-15.5 miles per week](#) in the last 2 quarters. While the manipulation capabilities leverage ML, navigation perception has been upheld with manually tuned geometric heuristics that aren't amenable to the [data flywheel](#). To align with Proxy's [strategic staircase](#) I have been leading (single-handedly at times) a [multi-year, long time horizon & complex initiative](#) that upgrades through building, advancing & integrating ML technologies.

- Implemented [integration of image segmentation labels with HiFi map surfels](#) by ingeniously devising [association methods](#) without formal semantic storage within HiFi maps.
- Initiated and collaborated with [achristiansen@](#), [brentaustin@](#), [baintner@](#) and [danielho@](#) on a [multi quarter](#) sim [OKR](#) to produce a datagen pipeline for [realistic navigation scenes](#) in order to train panoptic segmentation models.
- Created [perception points](#) to [log annotation requests](#) during robot motion that led to the creation of a navigation specific image dataset ([>5400 images and rapidly growing](#)). Impacted [snajmark@](#)'s work of [image composition for training RetinaGANs](#) by enabling the use of annotated navigation backgrounds.
- Persistently managed collaborations on a [long time horizon effort](#) with minimal supervision. The [first step of this vision](#) is now within 1Q away with [promising results](#) to solve #3, #5, #8 and mitigate #4, #7 of the current set of [9 key navigation capability limitations](#) thereby directly impacting to improve >50% of them.

##### Led the migration of base planner occupancy grids

- Implemented the [occupancy grid generation through devising a minimal set of easily maintainable heuristics](#). The number of tunable parameters went down by >90% from >50 technically complex heuristics defined in multiple config files ([1](#), [2](#), [3](#), [4](#), [5](#), [6](#), [7](#)) down to 7 defined in [1](#) config file that may be intuitively configured by users. Influenced & prioritized work of [klose@](#) to help port implementation over to GPU.
- Applied software engineering expertise for a clean design that removes interdependencies and unnecessary state preservation (that causes other [issues](#)) to produce a simple view into the underlying HiFi map removing potential sources of bugs.
- [Strategized rollout](#) steps to enable a rapid migration and aligned all stakeholders. Continuously monitoring progress to re-strategize and realign collaborators (through [buganizer hotlist](#)).
- Preempted potential rollout issues by implementing a ripper to produce [visualization artifacts](#) during log regeneration and trained central triage team members in debugging. Triage is using this ripper proactively on existing [issues](#) to determine if the migration solves them.

##### Championed a cross functional OKR to create a cafe dish-cart towing benchmark in simulation.

- Created [requirements, managed expectations, and prioritized to schedule](#) tasks for all team members.
- Implemented ego masking for the trailer, updated blindspots, generated map from sim scene and integration tested the full service to ensure all components [worked well together](#) for a perfect [OKR score of 1.0](#).
- Provided periodic progress reports on multiple forums such as the SW all hands and Proxy newsletters.

#### The How

- Leveraged my deep & broad robotics knowledge and experience to design principled processes & tools for the [field triage process that I initiated](#) and executed with minimal supervision to great success for Proxy. Led by example to influence SWEs across different teams to invest in simplifying debug complexity and increase tools usability such that a central triage team was established in a [SW wide OKR](#) resulting in at least [3 dedicated Proxies](#) and [>1200 Proxy field bugs](#) triaged in <2 years while continuing to grow rapidly.
- Collaborated cross-functionally to set the foundation for creating the first Proxy internal 3D point cloud annotations datasets with [65k train](#) & [16k eval](#) scans. Led the [product requirements definition by setting the user vision](#) and influencing the tools team in creating a [log snipper within Viz-mkii](#) to automatically clip & send annotation requests to ScaleAI. This resulted in Proxy's seamless & successful pilot with ScaleAI and unlocked [3D model training with internal data](#).
- [Surfaced and highlighted](#) through an ongoing field triage process several current [technical](#) and [functional](#) capability limitations of robot navigation. ([peer bonus](#), [TOCC](#)). This bookkeeping quantifies and maps technical experiments/projects to on-robot field impact for several stakeholders.
- Managed cross organizational collaboration with Ops, QA, Services, Brain etc. by breaking down complexity and setting product level expectations as well as enabling users (SWEs and TVCs) through a [user guide for training](#) and several 1:1 sessions.

#### Self Development:

I would like to work on developing a holistic communication strategy that tells the story of the various new robot capabilities we would like to unlock, what a broader solution to it would entail, how we plan to solve it and what are the steps along the way. Thereby influencing and leading SWEs, PMs & TPMs of a diverse set of teams to align, get excited and contribute to solve high impact problems.

**Peer Feedback:** [mitri@](#)

Citizenship (optional): Please share any citizenship contributions you'd like to highlight that are aligned with the Proxy Mindset ([go/proxy-mindset](#)). Citizenship includes anything that helped Proxy, Proxies, or Proxy's culture, but aren't strictly written into your job description or team duties.

- Initiated and developed a [strategic cross-organization alliance](#) with [Datamind](#), a team within CoreML. This initiative attempts to [experiment with a migration](#) of the Object Properties training pipeline from the clunky and internally maintained Tensor2Robot to TF Examples hosted through Datamind. Influenced the work of 3-4 SWEs, TPM & PM among both organizations.
- Filed 3 patent applications: X-51977-00-PR, X-51836-00-PR, X-51705-00-US.
- Created SW University course [Perception A205](#). ([spot bonus](#))
- Evangelized the adoption of the `message_sync` library that I designed & implemented. Use of this paradigm/library is gaining traction within Proxy as a sustainable engineering practice.
- Spent a couple of days [debugging and fixing using a workaround](#) a bug in our IPC system pertaining to the allocation of `ActiveMessagePtrs`.

## Peer Feedback

How well does Ammar foster an environment of respect?

4 At Proxy's expectations

Why did you answer that way (respect)?

**Andy Christiansen / ENG SOFT / 7BX / (L6)**

Ammar is setting a great example of both humble and respectful but also accurate communication. I never experienced him being upset about the multiple delays from the sim team side on getting the navigation datagen with randomization up and running. In fact, he was always keeping his professional attitude and focused on the results we aimed for in the long run. He was also showing a lot of patience with us when we had to shift responsibilities in the sim team away from `baustin@` to myself.

**Sebastian Klose / ENG SOFT / 7BX / (L5)**

I've always experienced Ammar as extremely respectful. The calm attitude he brings into our team meetings and discussions is creating an atmosphere where everyone feels invited to participate. Most specifically I want to point out that Ammar's interactions with `Mitri@`, our test engineer for triaging, is a great example for inclusion (as well as teamwork). He has included him into our essential meetings, has worked with him to streamline the triaging process which helps narrowing down the actual causes of bugs.

**Ting Lu / ENG SOFT / 7BX / (L5)**

Ammar is constantly contributing to foster an environment of respect. He treats everyone with dignity and civility, and celebrates team diversity and inclusion.

How well does Ammar demonstrate teamwork?

4 Extremely well

Why did you answer that way (teamwork)?

**Andy Christiansen / ENG SOFT / 7BX / (L6)**

It is easy to work together with Ammar on the navigation datagen pipeline. Here are a few examples:

- He explained the requirements very well in his design doc, which makes it easy to work towards a common goal, and was a key to get new people onboarded on the effort (e.g. `danielho@`)
- When I asked for help on getting a benchmark for the navigation datagen pipeline, Ammar quickly connected the right people and provided insights into what needs to be done

**Kim Kleiven / ENG SOFT / 7BX / (L5)**

Ammar did a great job championing the dish drop benchmark OKR. He was extremely organized, listing out exactly what was required in order to complete the OKR, what had already been done, and who was currently working on what. This kept the team on track and everyone knew what the next thing to do was, making it easy for us to achieve the 1.0 score for the OKR.

**Sebastian Klose / ENG SOFT / 7BX / (L5)**

For the last two quarters I have been working more closely with Ammar on the basplanner grid generation from High-Fidelity maps. We had regular meetings and discussions around the right approach, which I always enjoyed. Ammar has also been thoroughly tracking potential blockers and required steps in the corresponding rollout plan. He always pulled in the right people and always kept the whole team in the loop through regular updates by means of highlight-slides. I already mentioned as part of the "respect" section, that Ammar has greatly integrated Mitri as our triaging person. One thing to add here, is that he also regularly shows how much we value Mitri's triaging efforts through shout-outs in our weekly meetings or via E-Mails.

**Ting Lu / ENG SOFT / 7BX / (L5)**

Ammar shows great teamwork spirits in all the projects we collaborated on, including perception scenario eval, integration of tracked obstacles with navigation grid for social navigation, etc. Moreover, Ammar initiated the field triage process for robot navigation, and led to establish a central triage team, showing his strong leadership skills.

What's one thing that Ammar can do to improve impact in their role?

**Andy Christiansen / ENG SOFT / 7BX / (L6)**

It took a really large amount of time to get the navigation datagen pipeline up and running, and Ammar showed a lot of patience during this effort. Now that we have at least the first baseline and work on a benchmark, it would be great to get more feedback and guidance from Ammar on the next steps, so we can iterate more quickly. I know we are currently in an in-between state, where the ownership of the datagen is not transferred yet and we are still experimenting. That phase would nevertheless highly benefit from getting Ammar more involved, especially since we all have very limited view on the problems, and could benefit from a broader perspective and deeper insight into the coming steps. One possible way of doing that would be to start managing the project more formally through tickets in Buganizer, or through some other tool. That way it will get easier to break-down the coming tasks into smaller pieces for the various people involved in the project, and it allows simpler progress tracking across time-zones and teams.

**Kim Kleiven / ENG SOFT / 7BX / (L5)**

When Ammar led the dish drop benchmark OKR, the changes he implemented to enable successful navigation with a cart attached were extremely impactful. Since he was championing the OKR and watching the performance of the service closely, he knew what tasks were most important to unblock the service. If Ammar had more tight integrations with service operations like that it would help him have a bigger impact on our services. He would be able to proactively identify low effort tasks that could quickly make operations smoother as well as flag any longer term projects that currently aren't being prioritized highly enough.

**Sebastian Klose / ENG SOFT / 7BX / (L5)**

"Learning based Navigation Perception" seems the most impactful workstream for proxy from a navigation perception perspective. I feel Ammar is usually bugged down with a lot of other workstreams that keep him from making more progress in this direction (we only really started with this). Ammar could have more impact, if he pushed back stronger on other stop-gap topics, e.g. by agreeing with stakeholders on a minimal subset of functionality required in the stop gap and referring them to a longer term, agreed upon "learning-based" roadmap.

**Ting Lu / ENG SOFT / 7BX / (L5)**

As a critical step to our holistic perception goal, learning based navigation perception surely will make a huge impact to our moonshot. This will rely on not only Ammar's deep and broad robotic expertise, but also his influence on the team's investments that need to be made to land the project sooner.

**Manager Assessment**

Assign a rating for your direct report based on the past 12 months. Visit [go/xperf-ratings](https://go.xperf-ratings) for more information.

### Manager Calibration Rating

- ☐ 1 - You have a lot of work to do: your performance is well below what's required for your role and you need to work with your manager on a plan to improve.
- ☐ 2 - You're performing well in most areas but occasionally miss what is required for your role. Work with your manager to understand what you're missing, developing, or still ramping up in and strive to leverage your strengths to fill in the gaps.
- ☒ 3 - You're performing strongly across all the dimensions of your role at X, and sometimes beyond what is required in your role.
- ☐ 4 - You've had an excellent cycle and are consistently performing well beyond what is required in your role.
- ☐ 5 - You've had a standout cycle and are performing significantly beyond what is required in your role.
- ☐ Not applicable - The Proxy did not work enough of the performance period, therefore the manager had insufficient info to rate them. The minimum threshold to receive a rating is typically 4 weeks worked during a performance period. Please work with your HRBP on any exceptions.

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 your Proxy 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 will be released to your direct report at the end of the cycle. Note: word count includes template.

### Calibration Notes

Role: Mapping IC owning the navigation interface, 2D grid, field triage, and scenario evaluation

#### Why not lower:

- Ammar is leading the effort to solve a large complex problem: transitioning navigation perception to HiFi maps and incorporating semantics for reliable drivable surface estimation.
- The dish-cart OKR was very well planned, led and executed by Ammar.

#### Why not higher:

- Ammar has started many steps toward overhauling navigation perception, but none has fully landed in services yet.

#### Details:

- Impact:
  - The dish-cart OKR was an important milestone for Sparkle (although paused right now), which Ammar has led to full completion (1.0 rating).
  - Ammar is having a positive impact on Proxy's engineering culture and toolbox. He is maintaining the central message sync library and continuously promoting good software architecture and engineering practices.
  - Ammar has transferred the navigation triage process to a central team and guided the team toward generalizing the triage process for all of Proxy SW.
  - Contributed to the Scale AI requirements and vision, which enables 3D labeling at scale for the first time in Proxy.
- Difficulty:
  - Ammar is the owner of navigation perception, which he currently transforms from a heuristic stopgap solution to a data-driven learned solution. Transforming navigation perception is highly interconnected with large parts of our system and Brain Mobility as a direct customer. Latency, range, resolution, tools, and cloud pipelines need all to be taken into account.
- Leadership:
  - As the dish-cart OKR champion, Ammar demonstrated very structured leadership and teamwork across 4 teams.
  - As the owner of navigation perception, Ammar is managing stakeholders, collecting requirements, and breaking feature requests down for implementation.
  - Ammar is providing excellent customer support for navigation perception with quick and structured triage and guidance and processes to empower customers. Furthermore, he is clearly managing expectations and contributing to the structured communication of capability limitations.
- Proxy mindset & citizenship
  - Ammar has frequently shared his knowledge, ideas, and progress via 15 perception highlight slides and a SW university course.
  - Initiated and promoted an excellent cross-org cooperation opportunity of Perception with Datamind.
  - Co-authored 3 patents.