

Supplementary

1. Full Prompt

Expert Comment Formatting. In this prompt, {comment.text} is the original expert comments in the EgoExo4D [1], {scenario_name} is the scenario of the video, and {task_type} is the TYPE label.

You are an expert assistant for editing instructional commentary in skill demonstration videos. I will provide you with segments of transcribed expert commentary from videos. These comments may include informal spoken expressions (e.g., "you know...", "I guess...", "kinda", etc.) and might consist of multiple sentences that are either semantically redundant or cover different aspects of the demonstration. The video is about a {scenario_name} scenario.

#Input to be processed
{comment_text}

#Input Description:

- Each group of comments is associated with a timestamp.
- The comments are labeled as {task_type}.

#Output Requirements:

1. Formalization:

- Eliminate all informal spoken language and filler expressions to produce clear, professional, and written-style language.

2. Semantic Consolidation:

- If multiple comments convey similar or overlapping content, merge them into a single, concise paragraph.
- If they refer to distinct points, split them into separate paragraphs, each focused on one specific point.

3. Categorical Clarity:

- Each paragraph should address only one execution quality or improvement suggestion.
- AVOID merging multiple suggestions into one paragraph by using transitions like "Additionally", "Also", "and", or "then".

4. Ensure Depth of Comments:

- if the original comments are too simple or obvious, or only describe a simple action without explaining or reasoning on it (e.g., "the execution is good/effective", "she raise her left hand"), discard them.

5. Information Grounding:

- DO NOT give information not mentioned in the commentary segment.
- DO NOT add information not mentioned in the original commentary segment.

6. Ignore Meta-comments:

- If any comment appears to reflect on the annotation process itself (e.g., apologizing for an error, noting that the expert did not fully review the video, expressing confusion or excitement about the video, stating invisibility of the video), do not include it in the output, even if it is phrased in an instructional tone. Only keep comments that clearly relate to the physical performance or improvement of the task shown in the video.

7. Labeling:

- Each output segment should be labeled by [Good Execution] or [Tip for Improvement] according to the original label.

#Output Format:

[<Label>] comment1
[<Label>] comment2

...

Question Generation. We give different prompts about questions labeled with “[Good Execution]” and “[Tips for improvement]” as follows:

```
TEMPLATE_QUESTIONTYPE = {
"good_executions": f"""The aim of the
question is to uncover the notifiable
actions or techniques.
- If the Expert Commentary gives
reasons for why the execution is
good or methods of how to conduct
this good execution, the question
should lead to these reasons or
methods based on the observed
execution.
- If the Expert Commentary describes
how the execution is well
conducted, the question should lead
to these descriptions.""",
"tips_for_improvement": f"""The aim of the
question is to uncover the actions that
are not optimal.
- If the Expert Commentary gives a
suggestion to improve the
execution, the question should lead
to these suggestions based on the
observed execution, not asking
questions as if you know the
"Expert Commentary".
- If the Expert Commentary describes
how the execution is poorly
conducted, the question should lead
to these descriptions.""",
}
```

In the prompt, {desc.text} is the atomic descriptions of the segment, {A} is a formatted comment, and {goal_template} is selected based on the TYPE label.

You are an AI assistant tasked with generating insightful questions. You will be observing a task video, presented as a "Narration" (seen as the surface-level actions) and the corresponding "Expert Commentary" (seen as deeper insights, reasons, or techniques).

#Narration of the video (seen as the surface-level actions)
{desc_text}

#Expert commentary of the video (seen as deeper insights, reasons, or techniques)
{A}

#About the video
This is a video of {scenario_name}
scenario.

#Goal
Your goal is to formulate questions specific on the observed scene after seeing the "Narration" to understand the deeper insights revealed in the "Expert Commentary", keeping in mind the specific context provided above. The questions should ultimately guide the learner towards an understanding similar to what an expert might articulate. The Expert Commentary is labeled as {task_type}.

#Guidelines

##Should

1. Ask for more than what is obvious from the "Narration" alone. It should probe into the *reasons*, *intentions*, *subtle techniques*, or *critical judgments* highlighted or implied by the "Expert Commentary".
2. The question should be conceptually related to the "Expert Commentary", but not presuppose the "Expert Commentary".
3. Based on the observed actions.
4. {goal_template}

##Should NOT

1. DO NOT ask for general evaluations, summaries, or opinions, such as:
 - "What is the overall quality of the performance?" (or other semantically similar phrases)
 - "What are the main points of the expert commentary?" (or other semantically similar phrases)
2. AVOID presuppose a *positive or negative* relationship between two observed actions.
3. AVOID presuppose a *positive or negative* consequences of the actions.
4. SHOULD NOT be TOO detailed by using technical terms overlap with the "Expert Commentary"

##Word Restrictions

1. AVOID vague phrases like "the video", "this movement", or "the performance".
2. DO NOT use words like "as noted/mentioned in the expert commentary" or other similar phrases that refer to the Expert

- Commentary.
3. DO NOT mention the timestamp of the video in the question.
 4. DO NOT use multiple question words in one question (such as "What ..., and how...?")
 5. AVOID questions that are too general, contain words like:
 - "specific", "aspect", "positioning", "movement", "contribute", "help", "improve", "stability", "effectiveness", "adjust"...

##Information Grounding

1. DO NOT give information or ask about information not mentioned in the provided "Narration" and "Expert Commentary".

##Output format (there must be a prefix "[question]")
[question] ...

Question Verification. In this prompt, {Qe} is the initial version of the generated question.

Verify whether the generated question. The question is generated after observing a task video, presented as a "Narration" (seen as the surface-level actions) and the corresponding "Expert Commentary" (seen as deeper insights, reasons, or techniques). The question is supposed to be formulated after seeing the video to understand gain the information in the "Expert Commentary".

If the question follows the rules, output "OK". If not, give reasons. When generating the reason, do not mention the index of rule that is violated.

#Question
{Qe}

#Expert Commentary
{A}

#Narration
{desc_text}

#Rules

Check the rules one by one.

1. based on the observable actions
2. not asking for overall evaluations, summaries, opinions or suggestions

3. not using technical terms that overlap with the "Expert Commentary"
4. not using multiple question words in one question

#Output format

- If the question follows the rules, only output:

OK

- If not, output the reasons:

Reason: _____

Question Regeneration. This prompt is constructed by adding the following text to the **Question Generation** prompt. {reason} is the reason generated by the Question Verification process.

##Bad Example and why it is bad (DO NOT generate question like this by avoiding the reason below)

[question] {Qe}
[reason for why it is bad question]
{reason}

2. EgoExoAsk Sample

We show some EgoExoAsk samples of QA (question-comment) pairs in Tab. 1.

3. Formatted Sample

We show some more formatted comments samples of QA (question-comment) pairs in Tab. 1. The original comments come from EgoExo4D.

Table 1. EgoExoAsk Samples.

Scenario	Question	Comment
cooking	What might be missing in the selection and placement of items that could affect precision in the task?	[Tip for Improvement] Gather the remaining tools, including a spoon and a measuring cup or measuring spoon, to measure the sweetener accurately.
music	What role does the timing of finger placement play in achieving consistent dynamics and articulation while playing the guitar?	[Good Execution] The guitarist demonstrates efficient technique by placing the lower finger down in a timely manner, which contributes to an excellent display of uniformity in both dynamics and articulation.
soccer	What specific body positioning allows the player to stop and control the ball effectively with one leg?	[Good Execution] The player maintains a stable and effective body position, with the foot in a proper alignment, toe pointed downward and knee positioned over the ball. This posture supports control and balance, enabling precise execution of the action.
health	What might be the purpose of tapping the mannequin and then removing the hands before repeating the action?	[Good Execution] The responder demonstrates effective initial assessment by physically tapping the victim and asking questions to determine their responsiveness. This approach is critical for evaluating the victim's condition and ensuring an appropriate response based on their level of consciousness.
basketball	What role does bending the knees play in how the ball is released during the throw?	[Good Execution] The player effectively loads into her legs by squatting down, which allows the ball to gain lift upon release. This positioning contributes to a strong follow-through and proper placement of the shooting hand underneath the ball.
dance	How might the lack of movement in the arms affect the overall expression and flow of the body during the sequence of steps and jumps?	[Tip for Improvement] Her arms remain rigidly at her sides, contributing to a static and uninvolved upper body presence. A more expressive use of the arms would enhance engagement and articulation of movement.
bike repair	Why is it important to break the tire bead free from the rim before moving the wheel?	[Good Execution] Once the air has been fully released, the mechanic ensures that the tire bead is broken free from the rim. This allows for easier removal of the tire.
rock climbing	How might the climber's use of the right foot affect his ability to maintain a relaxed grip on the holds?	[Tip for Improvement] The climber's current positioning limits his ability to relax on the hold due to poor opposition in his posture. It would be beneficial to observe how much force is being applied by the right foot, as this could indicate whether adjustments in lower-body positioning might improve balance and reduce upper-body tension.

Original Comments	Formatted Comments
<p>"she's doing a good job by holding on to the tube or buffer system with one hand pretty secured", "She's got her swab stick inside and she's stirring it around in there", "ensuring that she's getting every last bit or, you know, all that she can of her specimen off of the tip of the swab and into the liquid here", "She's doing a really good job of doing that."</p>	<ol style="list-style-type: none"> 1. The individual is effectively using one hand to securely hold the tube or buffer system. This ensures stability during the transfer process. 2. The swab stick is being inserted into the liquid and moved in a manner that promotes thorough mixing. This technique helps maximize the collection of specimen material from the swab tip and facilitates its transfer into the liquid medium.
<p>"I like all the prep that's going into it.", "She is not only looking at the hold, she's also brushing the hold.", "this climber is showing that she has an understanding of what that means by brushing the hold and she wants to have better grip with these handholds", "This climber starts by brushing the holds."</p>	<ol style="list-style-type: none"> 1. The climber demonstrates a clear understanding of technique by brushing the holds before grasping them. This action indicates an awareness of improving grip quality and preparing for secure contact with the handholds. 2. In addition to brushing, the climber also carefully inspects the hold, showing attention to detail and preparation prior to engaging with the climbing surface.
<p>"we'd love to see a big one-two step to gather momentum", "Take a little bit off when hitting the backboard.", "Want the ball to hit the backboard as it's going down, not as it's going up.", "Follow the fundamentals."</p>	<ol style="list-style-type: none"> 1. Execute a strong one-two step to generate momentum before contacting the backboard. Time the movement so that the ball strikes the backboard while descending, not ascending. 2. Maintain proper fundamentals throughout the motion.

Table 2. More examples of formatted comments.

4. Retrieval Pool for Qualitative Results

The retrieval pool constructed for the first video is as follows:

The root end of the green onion is properly removed.

The preparer is making cross cuts to create small rounds of the green part of the onion. This technique demonstrates a clear understanding of how to achieve uniformity in vegetable cutting.

A Japanese or Chinese cleaver is being used for the cutting task, which is an appropriate tool choice for this type of vegetable preparation.

The cutting is taking place on a wooden cutting board, which is suitable for use with heavy cleavers and helps preserve blade sharpness.

The preparer maintains proper hand positioning: knuckles are out, fingertips are tucked under, and fingers are pressing down to stabilize the vegetable during the cutting process.

The cutting motion is efficient, indicating good control over the knife and a steady rhythm that contributes to consistent results.

The individual is correctly preparing the garlic by carefully removing the cloves from the bulb. This step ensures that each clove can be used separately in cooking and helps prevent the garlic from burning due to uneven sizing.

The chef is using the flat side of the knife to press down on a clove of garlic, which helps break the skin and facilitates its removal. This technique also aids in releasing the garlic's natural oils.

Remove the remaining portion of the white paper.

The chef maintains proper knife control by anchoring the tip of the blade on the cutting board with his left hand, allowing his right hand to perform the cutting motion effectively.

He positions the garlic cloves close together and applies a consistent up-and-down cutting motion with the knife to mince all three cloves simultaneously.

The individual cracks the eggs directly onto the countertop corner before transferring them into the bowl, demonstrating a smooth and efficient workflow.

Whisking effectively combines the yolk and white, ensuring a homogeneous mixture. Adding salt at this stage helps to

evenly distribute flavor throughout the ingredients.

The cook effectively manages the timing by allowing the pot to warm up while preparing the egg mixture, ensuring that both components are ready in coordination with one another.

The cook is using a nonstick skillet placed over the heat source of a gas stove. The gas flame has been properly ignited and positioned beneath the skillet to begin heating it.

A saute pan has been selected and placed on a heat source to preheat. A neutral-flavored oil is being added to the pan. The use of a neutral-flavored oil helps create a nonstick surface, which is ideal for preventing food from adhering during cooking. Examples of suitable oils include canola oil and grapeseed oil.

Additional oil is being introduced into the pan to ensure an even coating and optimal heat distribution.

Swirling the pan allows the oil to spread evenly across the base, ensuring uniform coating for consistent cooking results.

As the pan is heated, another swirl is made to ensure the coating is applied more evenly across the base.

The oil will have reduced viscosity.

The egg is introduced into the pan without producing a significant sizzling sound, indicating that the pan may not have reached an optimal temperature for searing.

To ensure even distribution of salt, it is recommended to briefly whisk the ingredients again before proceeding. This helps prevent the salt from settling at the bottom of the dish.

The chef begins swirling the egg mixture in the pan, using chopsticks to pull the cooked edges inward. This technique allows uncooked portions of the egg to spread into the available space, promoting even cooking and a consistent texture.

To ensure the egg cooks evenly, allow the uncooked portion to spread into the available space while continuing the cooking process.

The pan was used consistently throughout the process, and the movement of onion and garlic into the pan was executed smoothly.

The preparer is using a pancake turner to gently press down on the tomatoes in order to extract some of their juices. This technique helps facilitate the release of liquid, which can be beneficial for subsequent steps in food preparation.

The juice content of tomatoes can vary significantly depending on their size and ripeness. Larger, fully ripe tomatoes tend to release more liquid when cut into quarters or wedges. In contrast, smaller varieties such as cherry or grape tomatoes generally contain less moisture and will not yield as much liquid when prepared in a similar manner.

The individual is effectively using heat to steam the mixture, which helps in evenly distributing warmth and enhancing the blending process.

The technique effectively extracts both the juices and the flavor from the tomatoes, which contributes to creating a rich sauce for the eggs.

The individual is incorporating tomato sauce into the mixture, which contributes additional depth and flavor to the sauce being prepared.

Pureed tomatoes are also being added to the mixture, further enriching its base and consistency.

The execution enhances the tomato flavor by carefully balancing acidity and sweetness, resulting in a more vibrant and well-rounded taste profile.

During the off-season, when tomatoes may not be at their peak quality, smaller tomatoes will contribute less of the rich, robust tomato flavor typically desired in such dishes.

Apply pressure to the tomatoes to achieve the desired effect.

The individual is incorporating salt into the tomato mixture, which helps enhance the flavor and balance the overall taste of the dish.

The use of freshly ground black pepper effectively enhances the flavor profile by introducing depth and complexity to the dish.

The seasoning was applied thoroughly and evenly, ensuring optimal flavor distribution.

The cooked scrambled egg is incorporated into the tomato mixture, where it is gently broken down into smaller pieces and heated to ensure it reaches a

uniform temperature with the sauce. The visual appearance of the eggs indicates a successful execution at this stage of preparation. The execution was effective, as the egg was not overcooked. Using a smaller, more precise knife would enhance the accuracy and control when chopping the green onion. Ensure all ingredients are organized and prepared prior to beginning the cooking process to maintain efficiency and clarity during execution. Whisking should be performed using a consistent bottom-to-top circular motion to effectively incorporate air into the mixture, resulting in a fluffy egg texture. The use of appropriate tools such as a fork or wire whisk is recommended to facilitate this process. The objective is to achieve a fully homogeneous mixture where no streaks of egg white or yolk remain visible. The skillet should have been allowed to heat sufficiently before adding the egg mixture. A proper sizzle upon contact indicates that the pan has reached an appropriate temperature, which is essential for achieving a well-cooked result. The cook may have improved the dish by sauteing the garlic and tomatoes before proceeding. It will be necessary to remove the egg from the pan and allow it to rest temporarily. Allowing the egg to sit and cool before reintroducing it to the hot mixture increases the risk of overcooking, as the residual heat from the surrounding ingredients will continue to cook it further. To maintain optimal texture, the egg should be incorporated into the mixture while still warm but not fully cooled. The item should be transferred to a separate container before refrigeration. It is recommended to use a glass container with a properly fitting lid to ensure safe and appropriate storage. Salt can be used to counteract bitterness in tomatoes and also enhances the overall flavor of the dish. If bitterness is present, salt is an effective option; sugar may also be used as an alternative.

A significant portion of the liquid had evaporated during the process.

The retrieval pool for the second video is as follows:

The climber begins the attempt by thoroughly brushing the holds, particularly the older ones, to remove excess chalk. This ensures a clean surface for better grip and optimal performance. Brushing the holds is a strategic technique that provides climbers with an advantage by allowing them to clean the surface and restore friction. This action also enables a more thorough visual and tactile assessment of the hold, which can be crucial for planning movement and improving grip confidence. The act of brushing facilitates a closer inspection of the hold's texture and shape, offering insights that may not be apparent from a distance. This investigative approach helps climbers make informed decisions about their next moves and enhances their overall route-reading ability. The right hand is positioned in the pocket, and both the left and right feet are firmly planted against the wall. The climber takes a deep breath to regulate their breathing in accordance with the intensity and pace of the climb. The climber maintains an active grip on the starting holds, demonstrating focus by visually identifying the next hold before making a significant leftward movement to reach it. The selected hold is of sufficient size and quality to support a down-pulling position, indicating good route-reading and hold assessment. There is an effective use of a thumb catch underneath the hold, which enhances grip security and engagement. The performer promptly retracts the limb upward, maintaining a high left foot position to effectively align with the lower section of the Waco Jug. The climber maintains a straight right arm while in a tethered position, which contributes to stability and control. This allows for an effective movement sequence as the climber transitions through a slanted hole to establish a more advantageous position on the right side.

The decision to cross under with the hands demonstrates strategic thinking and planning ahead, enabling the climber to progress upward and to the right in a fluid and efficient manner.

The footwork during this movement is well-executed, supporting the climber's balance and positioning throughout the transition.

In this position, the climber is primarily supported by the right hand, illustrating how one strong anchor can be used effectively to manage body weight and momentum.

The climber is using excessive upper body strength to reach the next hold, which is inefficient and counterproductive. This approach consumes significant energy and works against the natural swing of the body. To execute such a move more effectively, it is essential to lock in the feet and utilize body positioning to maintain balance and control during the movement.

The climber effectively uses a heel hook by transferring their body weight upward, allowing them to elevate their feet and reduce the load on their hands. This technique enables the climber to maintain a higher foot position while using the mechanical advantage of the heel to pull the body closer to the wall.

The placement of the left heel is precise, with the heel and toes pointing outward. This positioning facilitates a stable hold that allows the climber to twist their foot, creating a camming action between the heel and toe against both the upper and lower surfaces of the mouth-shaped hold. This mechanical engagement significantly reduces the reliance on hand strength.

By bringing the feet into a higher position, the climber utilizes the heel-toe cam as a stable base. This position locks down the left hand and provides a solid foundation for transitioning out of the current cross and rolling over to the next hold.

The climber demonstrates effective use of the right foot by applying strong pressure to the starting hold, which supports the upward movement and contributes to maintaining balance during the transition.

The execution of the action is effective and demonstrates a high level of

proficiency.

The athlete should allow a slight sag in the left arm to create balance, while maintaining full extension in both arms. This positioning will provide a stable and efficient posture, enabling smooth foot movement without resistance or unnecessary effort.

The climber effectively executes a technical movement by combining a left heel hook with a right-hand lock-off. This coordinated effort generates upward and inward force, enabling the climber to progress their body position closer to the wall. The integration of these two elements allows for a smooth transition into securing the next hold with the left hand.

After establishing the right-hand lock-off, the climber drops the right foot while maintaining heel-toe camming, which facilitates progression of the left hand up the wall. Weight is then transferred between the right hand and left foot, allowing for a controlled shift of the hips to the right. This creates a stable platform from which the climber can continue ascending.

The climber releases the left heel from the yellow hold in a fluid manner, allowing momentum to carry the leg over to the opposite side of the wall. This approach avoids resisting the natural motion and enables immediate placement of the foot on the new surface. Such a technique is particularly effective when both feet are required to leave contact with the wall simultaneously.

The climber effectively utilizes momentum to control the swing and elevate their right foot onto the foothold. This technique demonstrates efficient energy transfer, allowing them to maintain balance and progress upward.

With the left hand anchored, the climber applies downward force through the right foot, generating significant power. This positioning enables a stable and effective movement into a favorable climbing position.

The climber initially contacts the hold with an open hand and extended fingers, which is a more relaxed and energy-efficient grip. Maintaining this open-handed contact when possible can help conserve physical energy during the climb.

Gradually shift the individual's weight while maintaining a wide stance.
Transfer the weight to the right side to establish a new tension point and use the right hand as an anchor.

Elevate the left foot to enhance positioning and attempt again with increased leverage over the hold.

Be mindful that this type of grip can lead to rapid fatigue if frequently used during holds.

The climber effectively utilizes a high left foot placement to offload weight from the arms, conserving energy by transferring as much load as possible onto the leg. This allows for more efficient movement and reduces fatigue in the upper body.

By shifting their weight onto the right hand and left foot, the climber creates a stable platform that enables upward momentum. This positioning also facilitates the ability to reach and secure the next left-hand hold with greater ease and control.

The use of a stick brush allows for efficient cleaning at higher levels without the need to climb, thereby conserving energy and improving access to elevated areas.

Plan the placement of brush strokes based on the intended use of each hold.
Position yourself as close as possible to the next hold before committing to a move, in order to maintain efficiency and reduce unnecessary movement.

Brushing the holds before an attempt helps remove excess chalk, which enhances grip quality by improving the contact between the hands and the handhold.

The climber is using a grip that appears awkward and inefficient, with the fingers excessively extended and the thumb positioned in an unusual way on the underside of the hold. This grip seems to require unnecessary bending of the elbow and wrist, which may compromise control and stability.

A more effective approach would involve using a thumb catch on the hold. This technique provides better opposition between the thumb and the remaining four fingers, allowing for improved control and the ability to manipulate the hips into a higher body position. This adjustment can enhance overall efficiency and reduce strain during the movement.

The climber's current positioning limits his ability to relax on the hold due to poor opposition in his posture. It would be beneficial to observe how much force is being applied by the right foot, as this could indicate whether adjustments in lower-body positioning might improve balance and reduce upper-body tension.

The climber is not fully transferring body weight onto the left foot before moving the right hand. A more complete weight shift to the left foot would provide greater stability and reduce the need for excessive upper-body effort when reaching for the next hold.

The movement is being executed too quickly, with insufficient extension of the right leg inside the frame. Extending the right foot further outward would allow for a more controlled and deliberate transfer of the right hand to the higher hold.

The climber catches the hold with significant force, which is inefficient at this early stage of the climb. High-effort movements at the beginning can deplete energy reserves and hinder the ability to complete the route effectively.

The climber is over-relying on upper-body strength rather than utilizing lower-body power and balance. A more effective approach would involve driving down through the feet and maintaining an opposite-arm-and-leg positioning to stay engaged with the wall.

If the climber had placed the right foot accurately before moving the right hand up, it might have created a small but destabilizing moment off the wall, requiring increased engagement from the arms and core to re-establish contact with the wall. Proper foot placement could help avoid such instability.

The climber should adjust the placement of their right foot to ensure better stability and control, as improper positioning increases the risk of losing contact with the wall. A more secure foothold will help maintain balance during movement.

To improve efficiency, the climber should open their body position further. This adjustment will create better reach and allow the right hand to transition smoothly to the next hold.

Dropping the right foot and shifting weight forward enhances stability. To counterbalance the downward force, engage by pulling upward with the left heel toward the right. However, the practitioner does not effectively transition out of the heel hook position. His movement results in his feet being cut off, placing excessive reliance on his left and right arms to support his weight.

The athlete should focus on driving the knee over the opponent's foot to maximize weight transfer away from the hands, allowing for greater efficiency and control in the movement.

Climbers should avoid placing excessive weight on a single foot, particularly when the foot is positioned between the hands in a bent-arm position. In this case, the climber placed too much reliance on the left foot, which was not optimally placed. As a result, when the foot lost contact with the hold, the climber struggled to maintain balance and control. This situation increases the risk of finger injury due to sudden eccentric loading and overextension of the fingers.

Proper foot placement is critical for maintaining stability and efficiency during climbing movements. The climber did not carefully assess or adjust the positioning of their left foot during the transition from right to left hand holds. This lack of attention led to an unstable foothold, which contributed to the loss of control. Climbers must focus intently on where their feet are placed and ensure that they are in a secure and functional position before committing to the next move.

A sudden loss of foot contact can make it extremely difficult to recover unless the climber has exceptional strength and body control. In this scenario, the climber attempted to compensate by shifting their left hand to a new hold, but the repeated loss of the left foot disrupted their momentum and balance. This highlights the importance of ensuring that each foot placement is deliberate and stable before progressing through the movement.

Climbers should be fully aware of how their feet contribute to pushing and pulling forces against the wall. Effective climbing requires the ability

to stand actively through the toes, using the feet to support body weight and generate upward force. Neglecting this aspect can lead to inefficient movement patterns and increased strain on the upper body.

References

- [1] Kristen Grauman, Andrew Westbury, Lorenzo Torresani, Kris Kitani, Jitendra Malik, Triantafyllos Afouras, Kumar Ashutosh, Vijay Baiyya, Siddhant Bansal, Bikram Boote, Eugene Byrne, Zach Chavis, Joya Chen, Feng Cheng, Fu-Jen Chu, Sean Crane, Avijit Dasgupta, Jing Dong, Maria Escobar, Cristhian Forigua, Abrham Gebreselasie, Sanjay Haresh, Jing Huang, Md Mohaiminul Islam, Suyog Jain, Rawal Khirodkar, Devansh Kukreja, Kevin J Liang, Jia-Wei Liu, Sagnik Majumder, Yongsen Mao, Miguel Martin, Effrosyni Mavroudi, Tushar Nagarajan, Francesco Ragusa, Santhosh Kumar Ramakrishnan, Luigi Seminara, Arjun Somayazulu, Yale Song, Shan Su, Zihui Xue, Edward Zhang, Jinxu Zhang, Angela Castillo, Changan Chen, Xinzhu Fu, Ryosuke Furuta, Cristina Gonzalez, Prince Gupta, Jiabo Hu, Yifei Huang, Yiming Huang, Weslie Khoo, Anush Kumar, Robert Kuo, Sach Lakhavani, Miao Liu, Mi Luo, Zhengyi Luo, Brighid Meredith, Austin Miller, Oluwatumininu Oguntola, Xiaqing Pan, Penny Peng, Shraman Pramanick, Meray Ramazanova, Fiona Ryan, Wei Shan, Kiran Somasundaram, Chenan Song, Audrey Southerland, Masatoshi Tateno, Huiyu Wang, Yuchen Wang, Takuma Yagi, Mingfei Yan, Xitong Yang, Zecheng Yu, Shengxin Cindy Zha, Chen Zhao, Ziwei Zhao, Zhifan Zhu, Jeff Zhuo, Pablo Arbelaez, Gedas Bertasius, Dima Damen, Jakob Engel, Giovanni Maria Farinella, Antonino Furnari, Bernard Ghanem, Judy Hoffman, C.V. Jawahar, Richard Newcombe, Hyun Soo Park, James M. Rehg, Yoichi Sato, Manolis Savva, Jianbo Shi, Mike Zheng Shou, and Michael Wray. Ego-exo4d: Understanding skilled human activity from first- and third-person perspectives. In *IEEE Conf. Comput. Vis. Pattern Recog.*, pages 19383–19400, 2024. 1