

# How Remesh Works

## HOW DOES REMESH UNDERSTAND PARTICIPANTS?

Remesh uses a machine learning model to capture the behavior of each individual participant, and of the group as a whole, for each open-ended Opinion Ask question in real-time. The model engages participants in a series of exercises in order to learn which responses participants agree or disagree with, as well as how much they agree or disagree with each response.

## HOW DOES THE MODEL LEARN AND PREDICT PARTICIPANT BEHAVIOR?

The Remesh model has one primary objective: infer every participant's preference (known as utility) towards each response. Infer is crucial here the model is making inferences about how participants would vote on responses since running a complete set of exercises on every response for each participant would be unmanageable in a live setting.

Our model learns from the live exercises the participant completes during the conversation, as well as the linguistic meaning of each response:

1. When a participant selects the response they agree with more from two choices, this tells our model that the participant has a higher preference (utility) for that response (+1).
2. When a participant says they "agree" with a response, that tells our model that their preference (utility) towards that response is positive (+1). If they select "disagree" our model learns that the participant's preference (utility) is negative (-1).

As an example, let's say we have 4 participants who each submit their own response. They all agree, disagree, or select one response or another. However, we don't get their preference (utility) for every single response the matrix below illustrates this:

	Response 1	Response 2	Response 3	Response 4
Participant 1	.5	0	-1	-No Data-
Participant 2	0	-No Data-	1	-.75
Participant 3	.5	0	-No Data-	0
Participant 4	-No Data-	-1	1	-.75

■ AGREE  
■ DISAGREE  
■ NEUTRAL

\*Entries without values mean the participant has not yet seen the response

A few important keywords to know:

**Utility:**  
A scale of how much a participant prefers a response.

**Utility Matrix:**  
A mapping of utility value from each participant to each response.

## HOW ARE THE GAPS FILLED IN?

Though we can't make explicit decisions about how every participant feels about a response (for example, we can't know for sure how Participant #2 feels about Response #2), we can make an educated inference based on other data in the matrix. In this example, participant #2 and #4 have the exact same opinions about response #3 and #4, so we can infer they would have similar opinions about other responses. Since we can't know for sure, we would assign values that are smaller:

	Response 1	Response 2	Response 3	Response 4
Participant 1	.5	0	-1	0
Participant 2	0	-0.5	1	-.75
Participant 3	.5	0	-1	0
Participant 4	0	-1	1	-.75

■ AGREE  
■ DISAGREE  
■ NEUTRAL

This is a simplistic version of the model, for more advanced reading on the matrix completion process Remesh does during an open-ended question please go [here](#).

## UNDERSTANDING THE RESULTS

The primary metric used within the Remesh platform is “percent agree”. **Percent agree is the percent of participants that our model has inferred would agree with that specific response out of the whole group of participants.**

This value is computed by simply counting how many participants have a positive preference (utility) and dividing that number by the total number of participants.

See below as an example of how you would calculate percent agree:

	Response 1	Response 2	Response 3	Response 4
Participant 1	.5	0	-1	0
Participant 2	0	-0.5	1	-.75
Participant 3	.5	0	-1	0
Participant 4	0	-1	1	-.75
<b>% Agree</b>	<b>50%</b>	<b>0%</b>	<b>50%</b>	<b>0%</b>

■ AGREE  
■ DISAGREE  
■ NEUTRAL

# Remesh Live Frequently Asked Questions

## WHERE DOES NATURAL LANGUAGE COME IN?

As the conversation is live, we generate a **mathematical representation of the semantic meaning of each response**. These representations indicate how similar a given response is to all other responses. The similarities between responses help the model more accurately predict utility scores. For instance, the model uses the knowledge that two responses are similar to assert that they have two similar sets of utility scores.

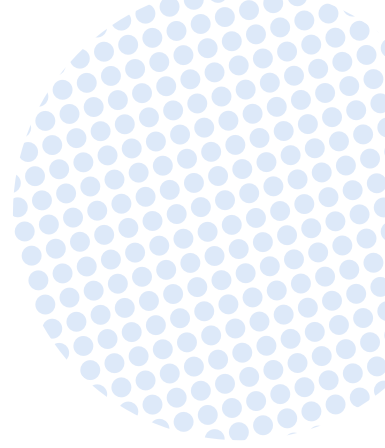
## HOW DO “COMMON TOPICS” WORK?

Remesh processes the language in participants’ responses before running them through a **natural language processing (NLP) algorithm that analyzes term frequencies to estimate their importance**. This allows Remesh to surface potentially interesting topics that arise.

## WHAT IS THE ACTUAL ALGORITHM THAT “COMMON TOPICS” USES?

The algorithm doesn’t simply count the number of times a word or phrase appears. Remesh currently uses a ranking algorithm called “Tf-idf” which stands for “term frequency-inverse document frequency”, and is used as a way to reflect how important a word is to a document. It works by **increasing proportionally to the number of times a word appears in a response, but is offset by the number of times that word appears in general**.

So, words that are common in every response, such as “this”, “what”, and “if”, rank low even though they may appear many times, since they don’t mean much in particular. Variations of the algorithm are often used by search engines as a way to rank and score a document’s relevance to a user’s query. In this case, document = a single participant’s response.



# Remesh Flex Frequently Asked Questions

## IS LIVE MORE ACCURATE THAN ASYNC?

No. The accuracy is nearly identical when using our latest class of prediction model.

## WHAT IS THE EXPERIENCE FOR THE FIRST FLEX PARTICIPANT?

The first participant will respond to each question but will not participate in the voting exercises shown when they submit their response on an Ask Opinion question type. Subsequent participants will participate in the voting exercises after submitting their own responses. This experience has no negative impact on the algorithm.

## HOW DOES THE ALGORITHM WORK FOR THE LAST FEW RESPONSES SUBMITTED?

The Remesh algorithm learns and makes predictions from the meaning it extracts from each response. For responses with little or no voting data, the algorithm can predict the percent agreement scores by extracting the meaning of the response with the same accuracy as responses submitted earlier in the conversation.

### Have questions?

Shoot them on over to us at [hello@remesh.ai](mailto:hello@remesh.ai) or visit [remesh.ai](https://remesh.ai)

