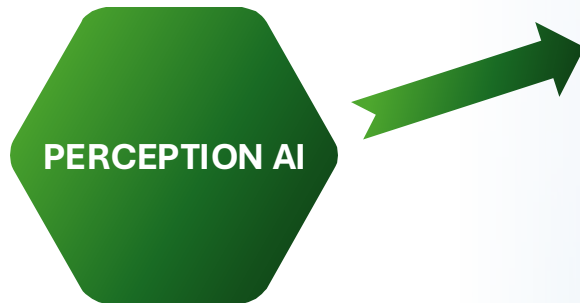




Work with GenAI via Open AI API

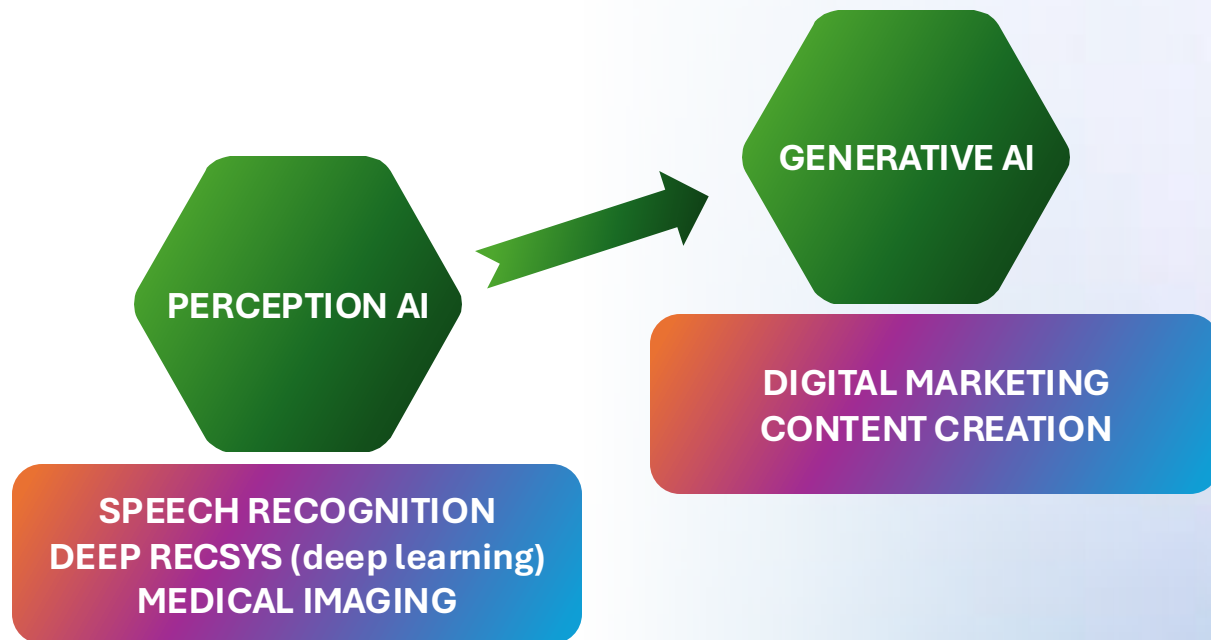
<Generate content with Open AI API>

AI evolution roadmap from NVIDIA:

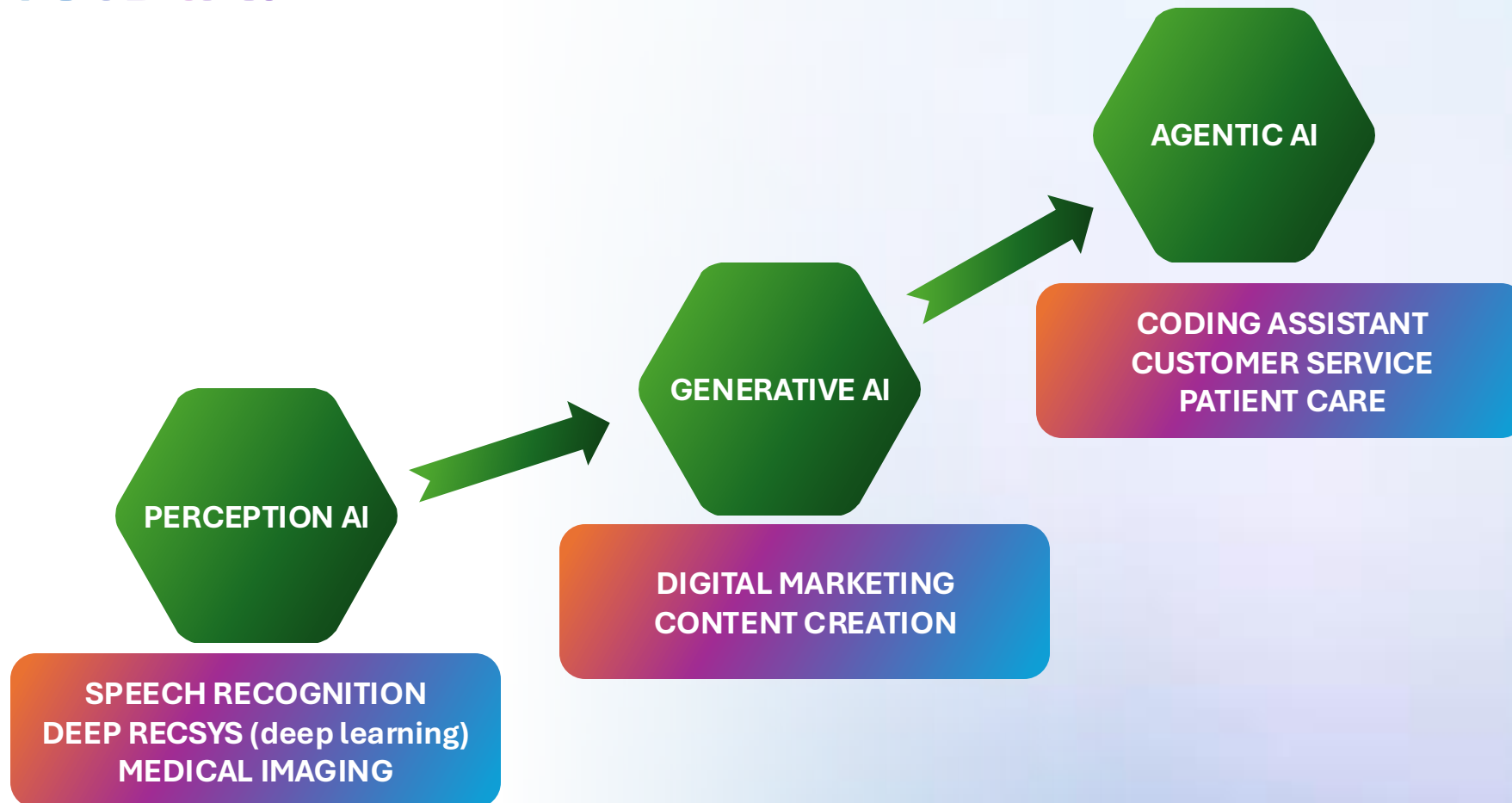


SPEECH RECOGNITION
DEEP RECSYS (deep learning)
MEDICAL IMAGING

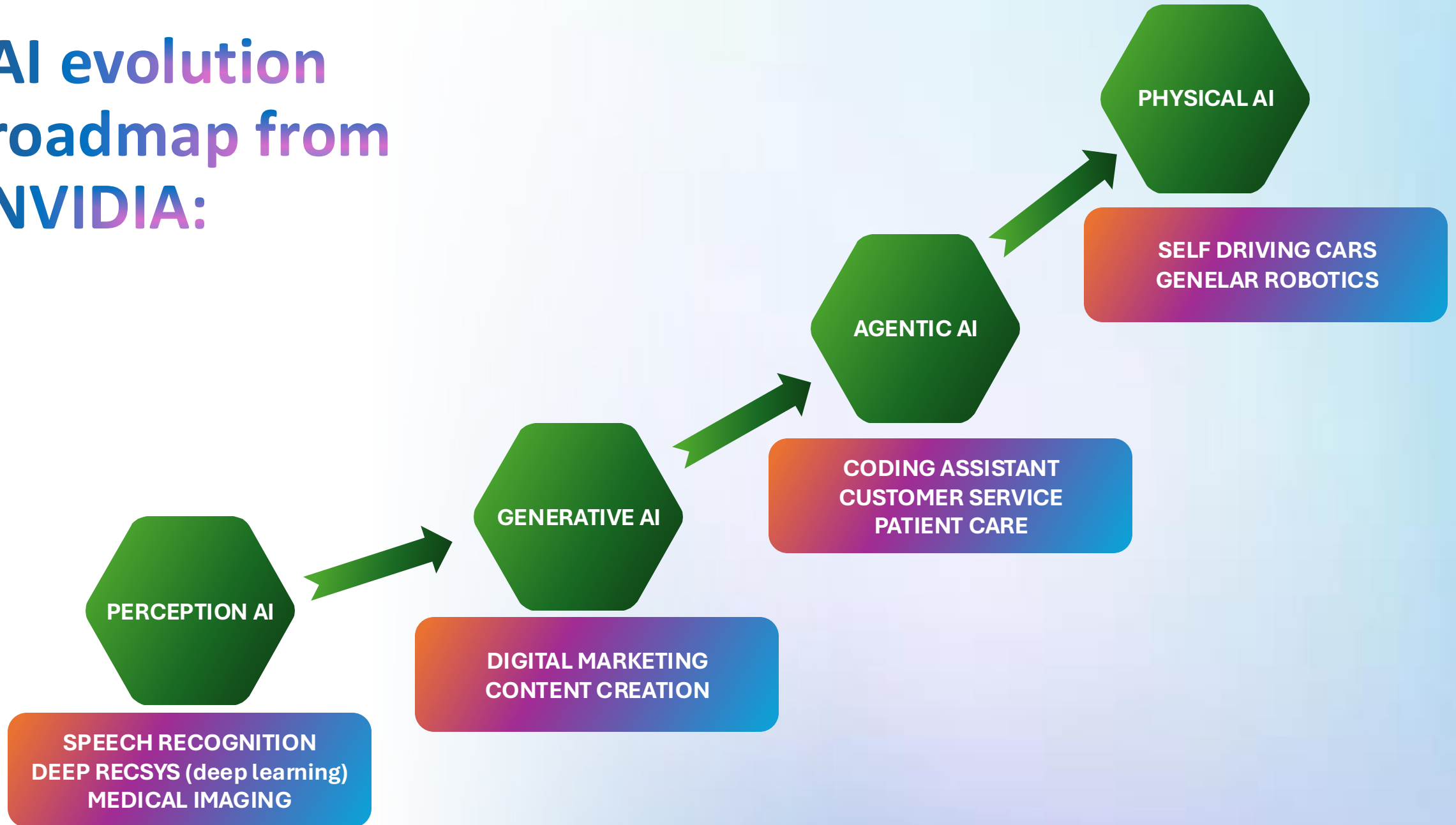
AI evolution roadmap from NVIDIA:



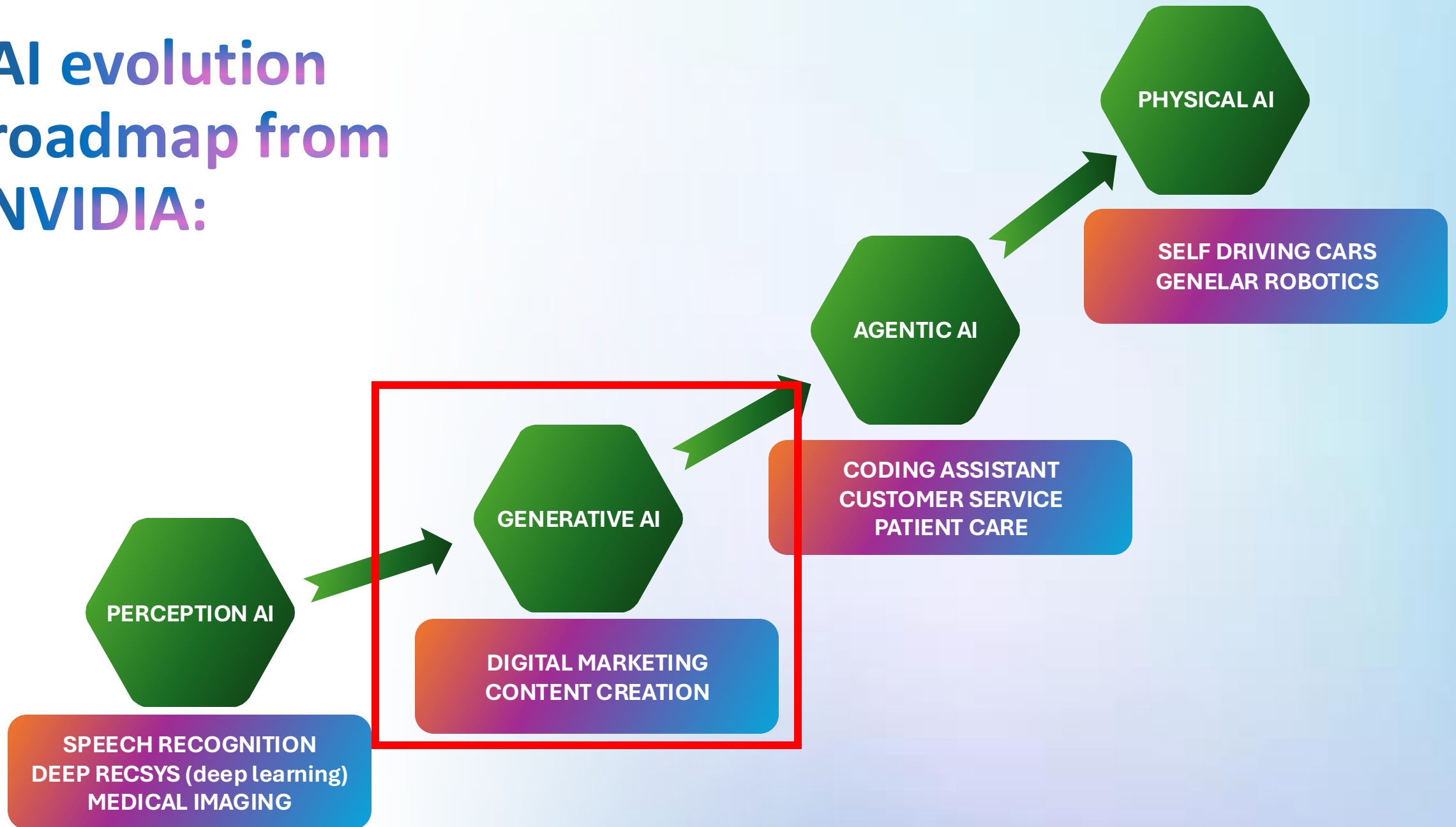
AI evolution roadmap from NVIDIA:



AI evolution roadmap from NVIDIA:



AI evolution roadmap from NVIDIA:





Generation models

<Quick overview over generation models>

Text generation LLMs:

- Text generation
- JSON generation (4o, o1)
- Image to text generation



gpt-3.5-turbo

gpt-4o

gpt-4-turbo

o1

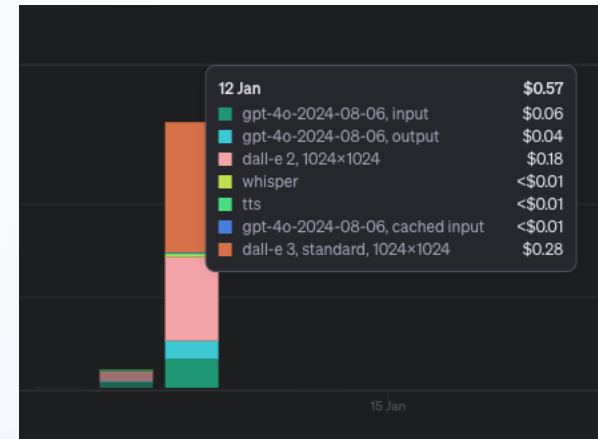


dall-e-2

dall-e-3

Text to Image generation:

- Generate Text to Image
- Pay attention that such generation is expensive



Speech generation and transcription:

- Speech to Text generation with whisper (transcript and translate to English)
- Text to Speech generation with tts



tts-1

whisper-1

gpt-4o-audio-preview



Today's tasks

<Quick overview over tasks and tips>

Tasks tips:

Task 1 Text To Json Generation

```
{
  "model": "gpt-4o",
  "messages": [...],
  "response_format": {
    "type": "json_schema",
    "json_schema": {
      "name": "email_schema",
      "schema": {
        "type": "object",
        "properties": {
          "email": {
            "description": "The email address that appears in the input",
            "type": "string"
          }
        }
      },
      "additionalProperties": false
    }
  }
}
```

Tasks tips:

Task 1 Text To Json Generation

Use `victools` for Json
Schema generation

JSON Schema generation:

```
import com.github.victools.jsonschema.generator.OptionPreset;
import com.github.victools.jsonschema.generator.SchemaGenerator;
import com.github.victools.jsonschema.generator.SchemaGeneratorConfig;
import com.github.victools.jsonschema.generator.SchemaGeneratorConfigBuilder;
import com.github.victools.jsonschema.generator.SchemaVersion;

private JsonNode generateUsersJsonSchema() { 1 usage  ⚡ "Khshanovskiy" *
    SchemaGeneratorConfigBuilder configBuilder = new SchemaGeneratorConfigBuilder(
        SchemaVersion.DRAFT_2020_12,
        OptionPreset.PLAIN_JSON
    );

    SchemaGeneratorConfig config = configBuilder.build();
    SchemaGenerator generator = new SchemaGenerator(config);

    return generator.generateSchema(Users.class);
}
```

Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Content as a String for regular
chat

```
{  
  "model": "gpt-4o",  
  "messages": [  
    {  
      "role": "system",  
      "content": "You are a helpful assistant."  
    },  
    {  
      "role": "user",  
      "content": "Write a haiku about recursion in  
programming."  
    }  
  ],  
  "stream": false  
}
```

Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Sample with content as array
with image URL

It should be public source for
image loading

```
{  
  "model": "gpt-4o",  
  "messages": [  
    {  
      "role": "system",  
      "content": [  
        {  
          "type": "text",  
          "text": "What is in this image?"  
        },  
        {  
          "type": "image_url",  
          "image_url": {  
            "url": "https://upload.wikimedia.org/....jpg"  
          }  
        }  
      ]  
    }  
  ]  
}
```

Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Sample with content as array in
Base64 encoding

```
{
  "model": "gpt-4o",
  "messages": [
    {
      "role": "system",
      "content": [
        {
          "type": "text",
          "text": "What is in this image?"
        },
        {
          "type": "image_url",
          "image_url": {
            "url": "data:image/jpeg;base64,{base64}"
          }
        }
      ]
    }
  ]
}
```


Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Task 3
Text To Image
Generation

<https://api.openai.com/v1/images/generations>

```
{  
  "model": "dall-e-3",  
  "prompt" "a white siamese cat",  
  "n": 1,  
  "size": "1024x1024"  
}
```

Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Task 3
Text To Image
Generation

Task 4
Audio To Text
Generation

<https://api.openai.com/v1/audio/transcriptions>

**Content-Type: multipart/form-data;
boundary=----OpenAIMultipartBoundary**

Tasks tips:

Task 1
Text To Json
Generation

Task 2
Image To Text
Generation

Task 3
Text To Image
Generation

Task 4
Audio To Text
Generation

Task 5
Text To Audio
Generation

<https://api.openai.com/v1/audio/speech>

```
{  
  "model": "tts-1",  
  "input": "Codeus the best!",  
  "voice": "alloy"  
}
```

Thank you

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- Date: January 2025
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