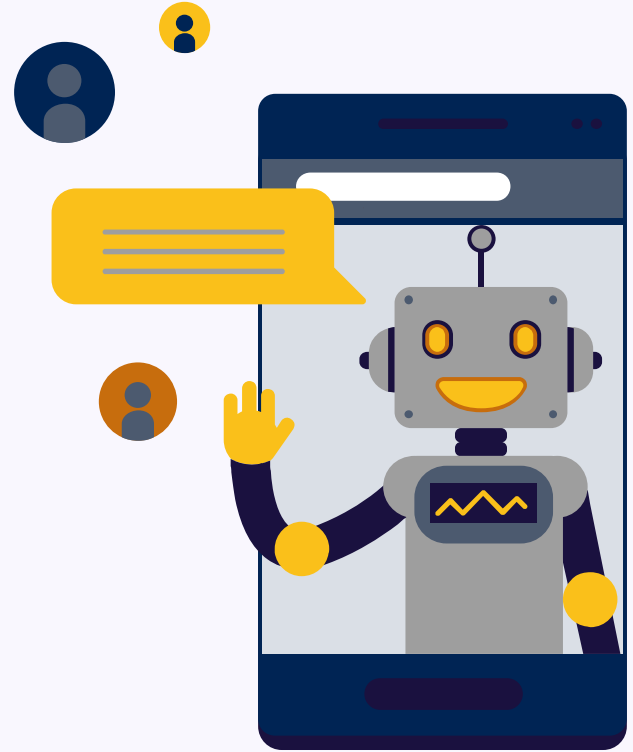


AI-Integrated Personalized Education

Capstone Presentation

Team 11: TutorTech





TutorTech > The Team

Team

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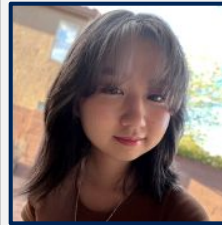
Conclusion

**CHASE
BABB**



Team Lead
*Backend
Developer*

**SHURIE
KAMEWADA**



*Database
Architect*

**RYLEY
FERNANDEZ**



*Frontend
Developer*

**FAITH
ONONYE**



*Frontend
Developer*

**PAUL
DEASY**



Mentor



TutorTech > The Sponsors

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DR. ANDY WANG



*Professor and
Director*

**SETHUPRASAD
GORANTLA**



*Program
Assistant
Manager*



*Metrology
Research &
Teaching
Laboratory*



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Major limitations within the current traditional education system:

- Lack of support in course comprehension
- Lack of immediate feedback
- Limited personalization opportunities



"Public school leaders estimated that about half — **49 percent** — of their students began the 2022-23 year behind grade level in at least one academic subject..."

National Center for Education
Statistics (2023)



TutorTech > The Problem

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Students enroll in
necessary course(s).

Students interact with
course material.

Students move forward
to next assignments.

Professor uploads
course material.

Professors start
grading completed
assignments.

Scores are published
with limited feedback.



[Team](#)[Sponsors](#)[Problem](#)[Solution](#)[Requirements](#)[Architecture/
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Fall 2024 Quick Facts: Class Size



Average Class Size

Undergraduate

100 Level	42
200 Level	40
300 Level	26
400 Level	20

NAU Institutional Research & Analysis Quick Facts



TutorTech > The Solution Overview

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An AI-integrated web application for a personalized learning experience

- Learning Management System specific to the MRTL
- Customizable AI-chatbot with adaptive support and analysis



Key Features

Multiple AI-Bot Personas

Tutor

Structured & Step-by-Step



Mentor

Encouragement & Direction

Co-Learner

Works alongside the student



Custom Learning Style

Tailored for the student

Personalized Learning Journey

Crafted by:

- Student Interactions
- AI Analysis
- Personalized Feedback
- Improved Learning Outcomes





TutorTech > Requirements

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High-Level Requirements



Responsive LMS



Engaging User
Interface(UI)



Real-time Grading
& Progress
Tracking



Protection of User
Data



AI-Powered
Adaptive Learning



TutorTech > Architecture & Implementation Review

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Implementation**

Product Showcase

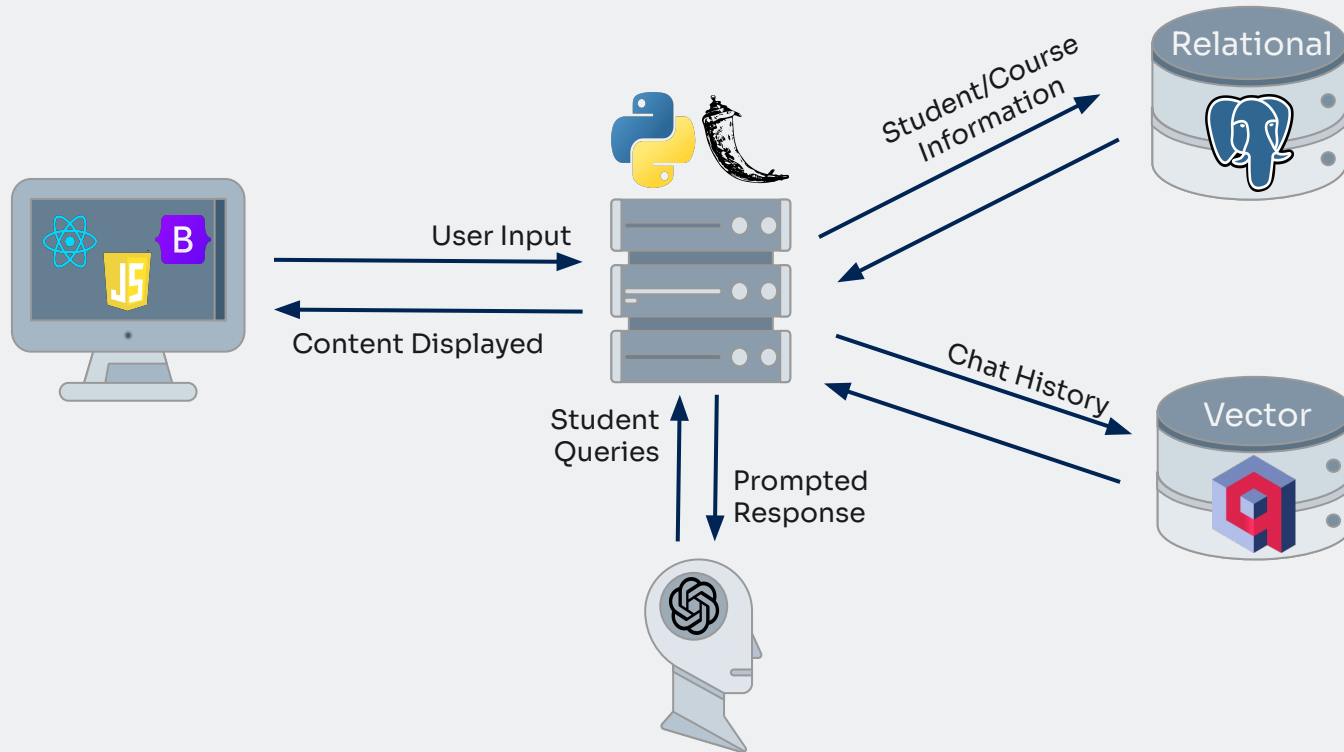
Challenges/
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TutorTech > Product Showcase

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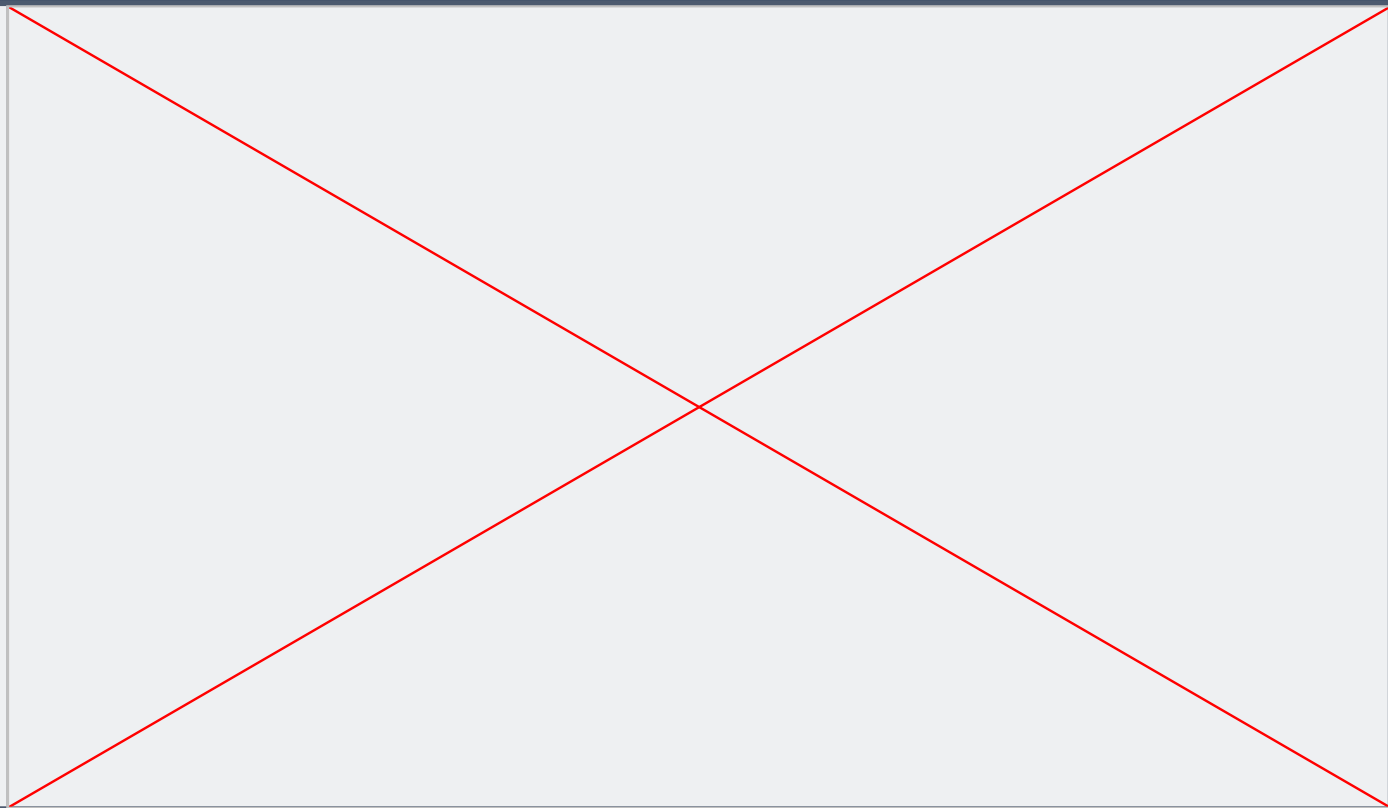
Challenges/
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TutorTech > Challenges & Solutions

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01

Hosting the application

- Removed local dependencies and migrated each aspect of the application over to the appropriate platform.

02

AI context

- Created algorithms to properly provide context based on the user's needs (semantic Vs recent history).

03

Course module integration

- Implemented modules for courses; allowing for easier access to specific features.



TutorTech > Schedule > Fall Semester 2024

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Initiative	August	September	October	November	December
UI Prototyping					
Database Setup					
API & Backend Setup					
AI Setup					
User Access Setup					
LMS Feature Integration					



TutorTech > Schedule > Spring Semester 2025

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Initiative	January	February	March	April	May
UI Enhancements					
Database Expansion					
Usability Testing					
Feature Finalization					
Document Finalization					
AI Implementations					



TutorTech > Testing

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▼ TERMINAL

```
tests\test_signup.py:43: AssertionError
----- Captured stdout call -----
Error during signup: value too long for type character varying(8)
```

```
===== short test summary info =====
FAILED tests/test_signup.py::test_signup_duplicate_user - assert 500 == 201
===== 1 failed, 1 passed in 6.83s =====
```

```
• (venv) PS C:\Users\faith\TTF\TutorTech> pytest tests/test_signup.py
```

```
===== test session starts =====
platform win32 -- Python 3.12.5, pytest-8.3.5, pluggy-1.5.0
rootdir: C:\Users\faith\TTF\TutorTech
plugins: anyio-4.8.0
collected 2 items
```

```
tests\test_signup.py ..
```

```
===== 2 passed in 5.81s =====
```

```
○ (venv) PS C:\Users\faith\TTF\TutorTech> █
```

```
testuser@example.com | Test123!
```

```
dupe@example.com | Dupe123!
```

```
dobby1@gmail.com | $2b$12$mKxne4QCDHvApSS
```

```
hazelblake86054@gmail.com | 2004isMybirthyear!
```



TutorTech > Future Work

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Enhance personalized learning features

Give students smart suggestions based on grades, habits, or missed work.



Instructor Mode

Special role that allows instructors to view and manage student progress.



Refine the chatbot

Pull in course data to give targeted support.





TutorTech > Conclusion

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Problem

- Lack of personalized support and meaningful feedback in student learning.



Solution

- Custom LMS for MRTL with assignments, grades, multi-persona AI chatbot (tutor, mentor, co-learner).



Impact

- Enables MRTL to better support students.



Thank You

Questions, comments, concerns?

Reference:

<https://in.nau.edu/institutional-research/quick-facts/>
https://nces.ed.gov/whatsnew/press_releases/2_09_2023.asp

CREDITS: This presentation template was created by Slidesgo, including icons by Flaticon, and infographics & images by Freepik

