

DELIVERABLE 4

■ Fall 2020 Capstone Project | Professor Henry Wong

Team members:

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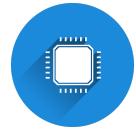




Project
Overview



Project
Requirements



Design
Architecture



Sprint Recap



Test Cases



Project Demo
(MVP)



GitHub
Walkthrough



Retrospectives



Conclusion

AGENDA

PROJECT OVERVIEW

PROJECT OVERVIEW

■ **What?**

- Image-based Self diagnosing web application

■ **How?**

- User image submission

- Trained machine learning-based model

- Results and information

■ **Why?**

- Does not require login

- No long sequence of questions

- Image-based

PROJECT REQUIREMENTS



PROJECT REQUIREMENTS

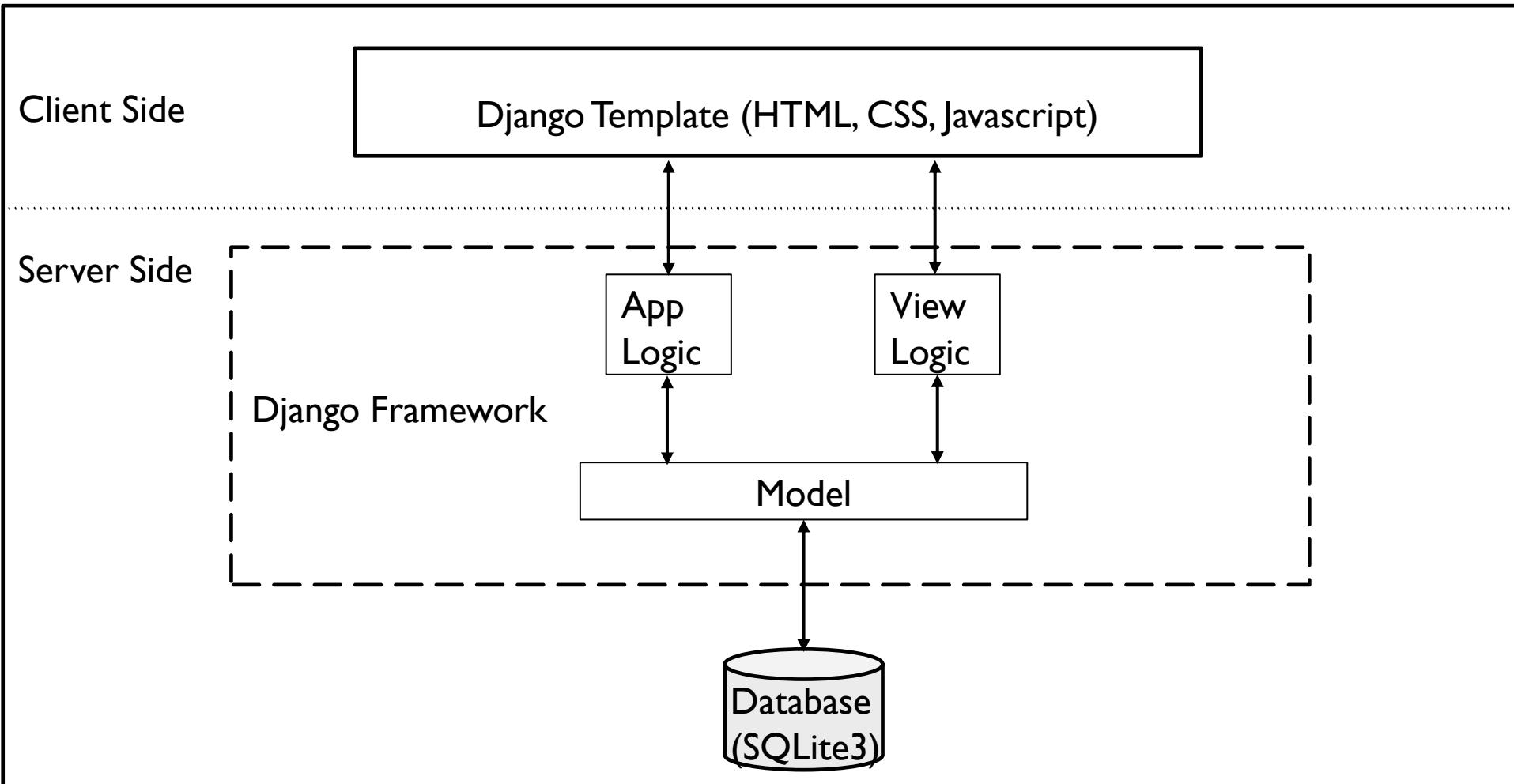
- Upload Image
- Find Nearest Emergency Room
- Receive Results
- Send Feedback

PROJECT REQUIREMENTS – USER STORIES

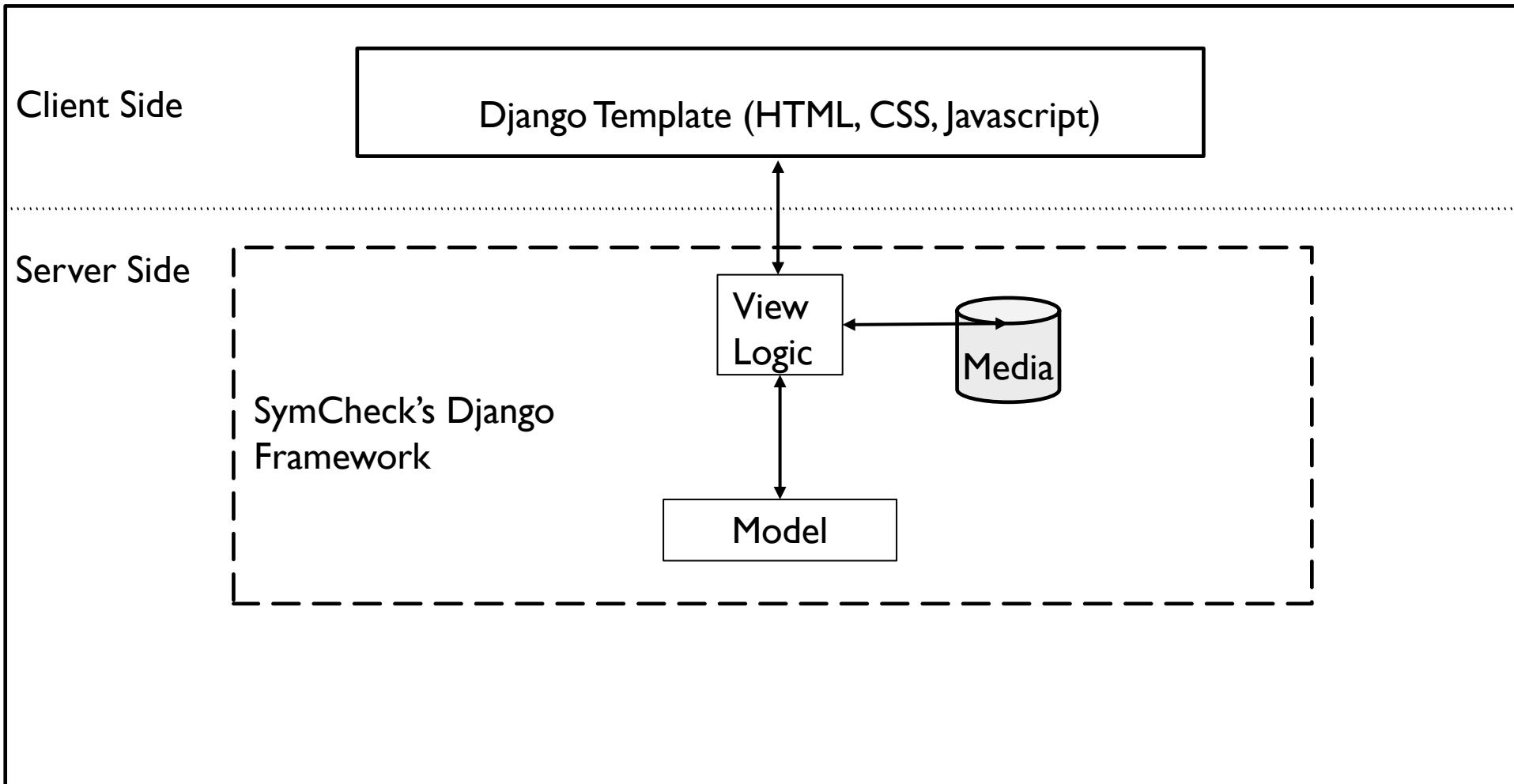
ID	As a	I want to	so that
US3	user	upload a photo/image of my symptom/affected area/illness	the SYMCheck application can diagnose me and I can gain insights as to what I might be afflicted with
US12	user	find the nearest emergency room	I can receive immediate medical attention if it is deemed necessary
US10	user	know what information I can obtain about this/any illness I might potentially have	I can gain an understanding of what might be causing my symptoms, and thus make an informed decision on how best to go forth with my care
US16	user	get in touch with the creators of the SYMCheck application	I can provide the creators of the SYMCheck application with suggestions/comments, ask them questions, commend them for their product, etc.

DESIGN ARCHITECTURE

DJANGO ARCHITECTURE

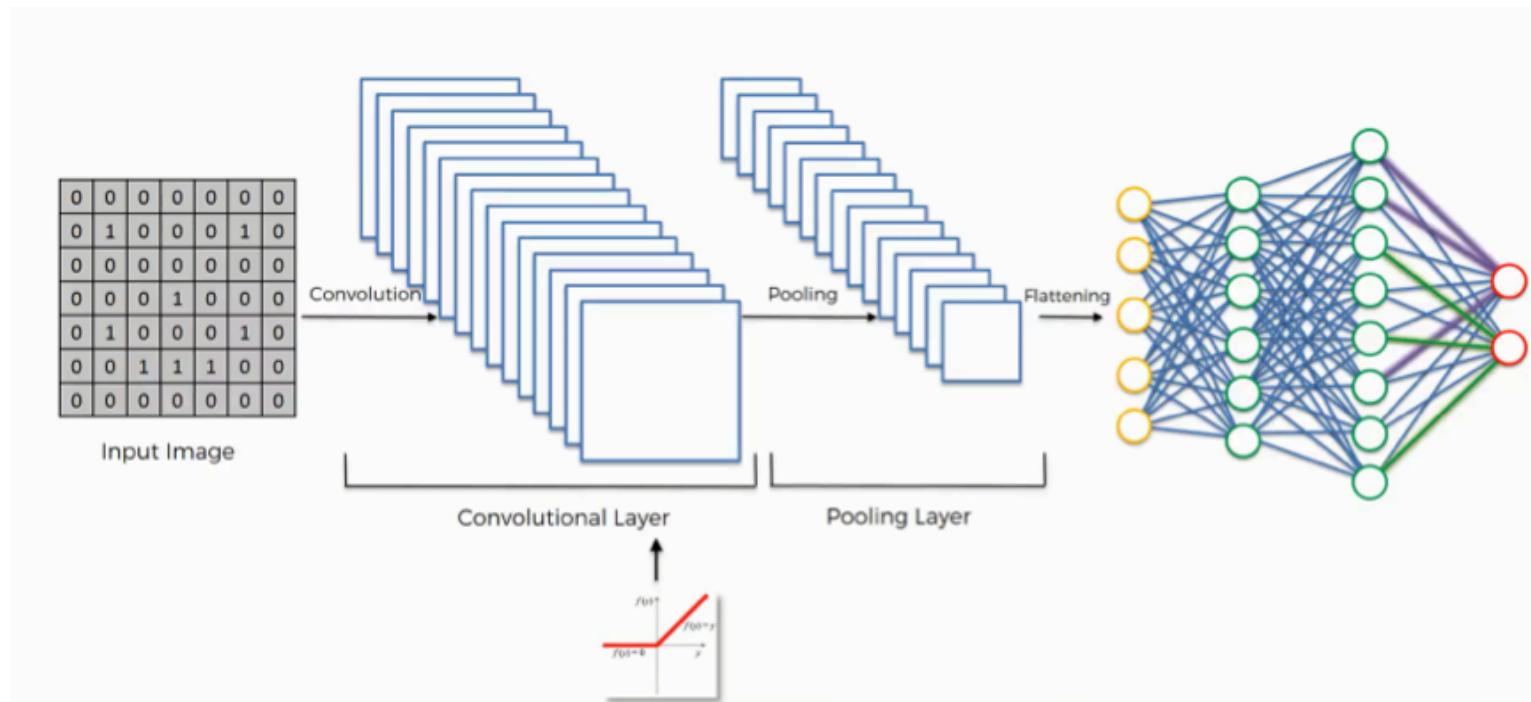


SYMCHECK DESIGN

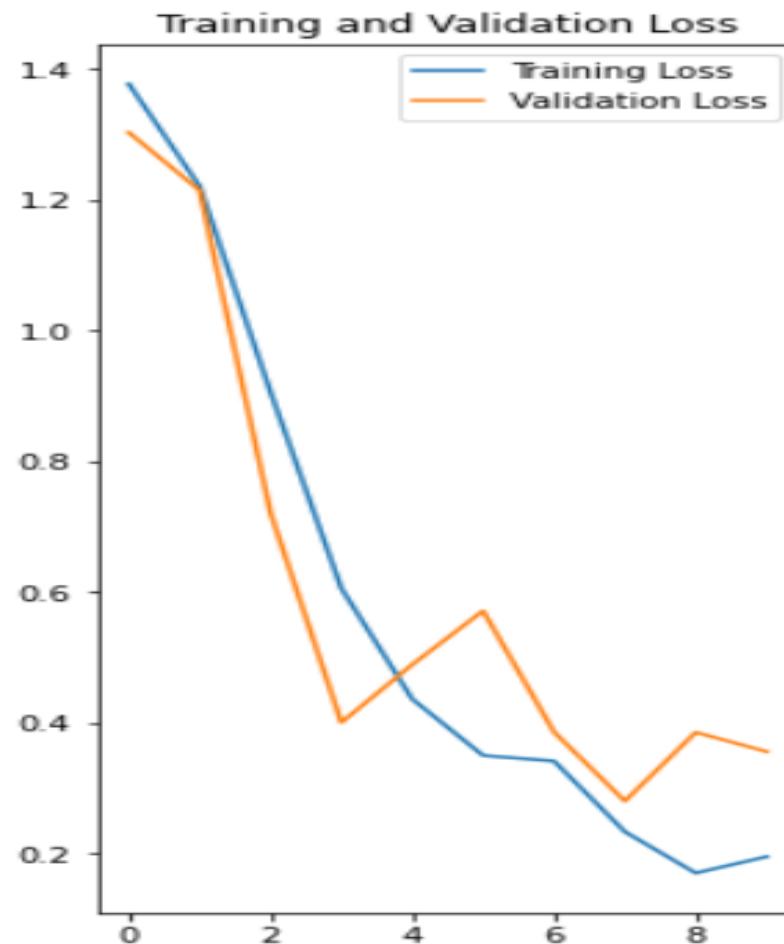
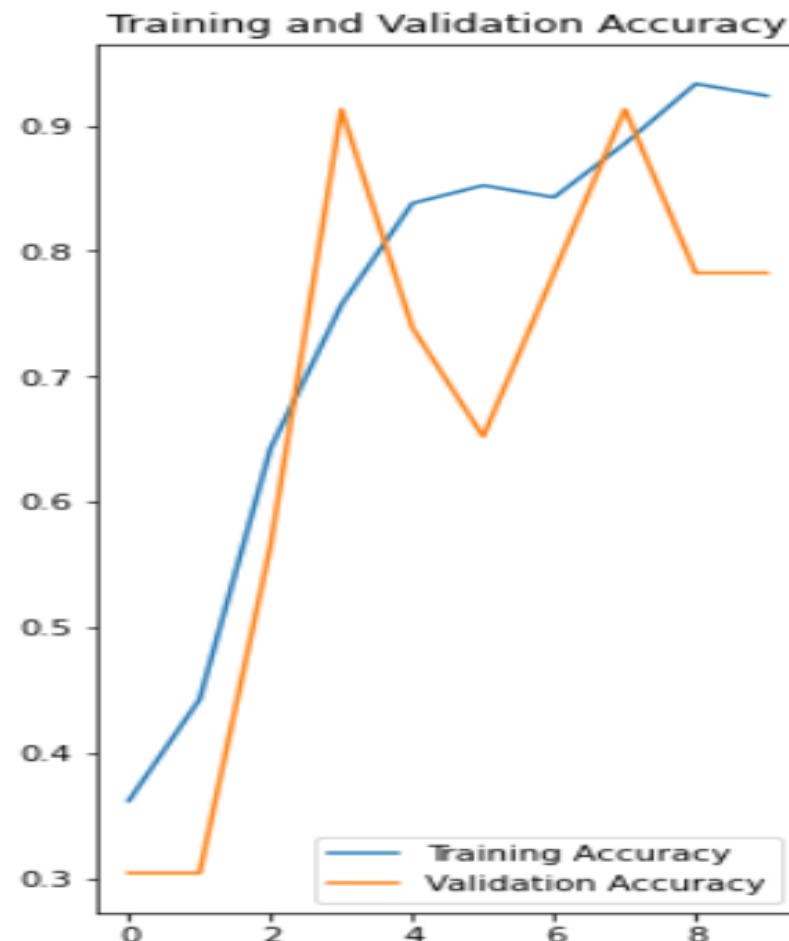


MACHINE LEARNING ALGORITHM

Convolutional Neural Network (CNN) -



MODEL EVALUATION





TIMELINE OF
IMPLEMENTATION

SPRINT
RECAP

WHAT IS AGILE DEVELOPMENT?

INDIVIDUALS AND INTERACTIONS	over	processes and tools
WORKING SOFTWARE	over	comprehensive documentation
CUSTOMER COLLABORATION	over	contract negotiation
RESPONDING TO CHANGE	over	following a plan

REVIEW OF SPRINT I (08/24 - 09/21)

Completed Issues

[View in Issue Navigator](#)

Key	Summary	Issue Type	Priority	Status	Original Time Estimate (- → 3w 2h)
HID-1 *	Project Survey	<input checked="" type="checkbox"/> Task	↑ Highest	DONE	- → 3d
HID-45 *	Create Deliverable 1 Presentation	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	- → 3d
HID-46 *	Create a significant business application idea	<input checked="" type="checkbox"/> Task	↑ Highest	DONE	- → 1w 2d
HID-47 *	Set up development tools (GitHub and Jira)	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	- → 1d
HID-48 *	Establish team roles	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	- → 2h
HID-49 *	Establish weekly meetings	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	- → 1d

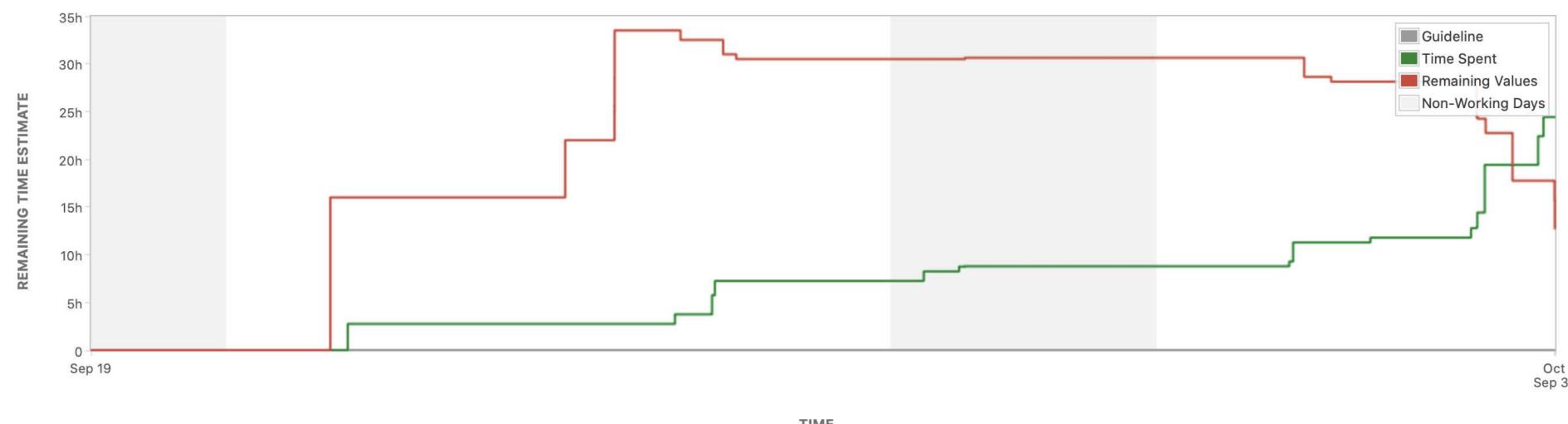


REVIEW OF SPRINT II (09/22 - 10/05)

Completed Issues

[View in Issue Navigator](#)

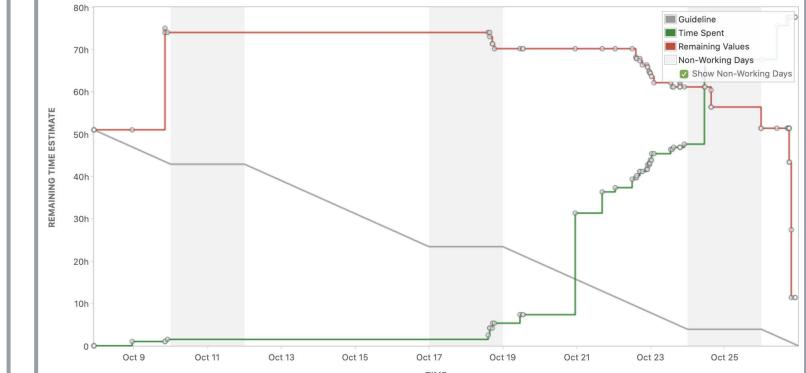
Key	Summary	Issue Type	Priority	Status	Original Time Estimate (- → 4d 6h)
HID-4 *	Research and find images of chicken pox and pink eye	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	- → 1d
HID-8 *	Complete User Stories	<input checked="" type="checkbox"/> Task	↑ High	DONE	- → 3h
HID-9 *	Complete Test Cases	<input checked="" type="checkbox"/> Task	↑ High	DONE	- → 6h
HID-10 *	Research Django Framework	<input checked="" type="checkbox"/> Task	↑ High	DONE	- → 5h
HID-11 *	Complete Acceptance Criteria	<input checked="" type="checkbox"/> Task	↑ High	DONE	- → 3h
HID-12 *	Complete Deliverable 2 PowerPoint Presentation	<input checked="" type="checkbox"/> Task	↑ High	DONE	- → 5h
HID-13 *	Create mock-up web designs	<input checked="" type="checkbox"/> Task	↑ Highest	DONE	- → 1d



Completed Issues

Key	Summary	Issue Type	Priority	Status	Original Time Estimate (1w 1h)
HID-17	Complete IEEE style technical paper (Deliverable 3)	Task	↑ Medium	DONE	1w
HID-28	Create Google API Account	Task	↑ Medium	DONE	1h
HID-29	As a user, I want to know that I have reached the correct page to use the SYMCheck application so that I can be sure I am uploading my picture to the correct place and receiving the recommendations/care that I desire	Story	↑ Medium	DONE	-
HID-36	As a user, I want to return to the homepage so that I can re-read the SYMCheck mission statement, disclaimer, etc.	Story	↑ Medium	DONE	-
HID-42	As a user, I want to navigate back to the home page so that to manually start over, or to read SYMCheck's mission statement	Story	↑ Medium	DONE	-
HID-44	As a user, I want to get in touch with the creators of the SYMCheck application so that I can provide the creators of the SYMCheck application with suggestions/comments, ask them questions, commend them for their product, etc.	Story	↑ Medium	DONE	-

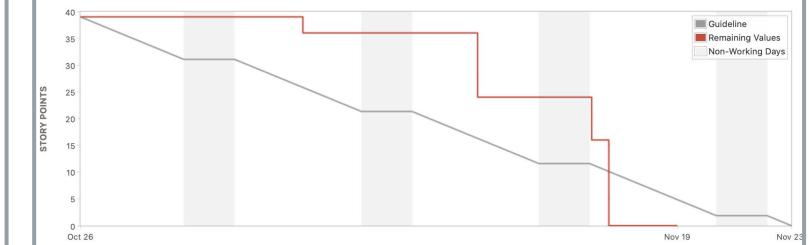
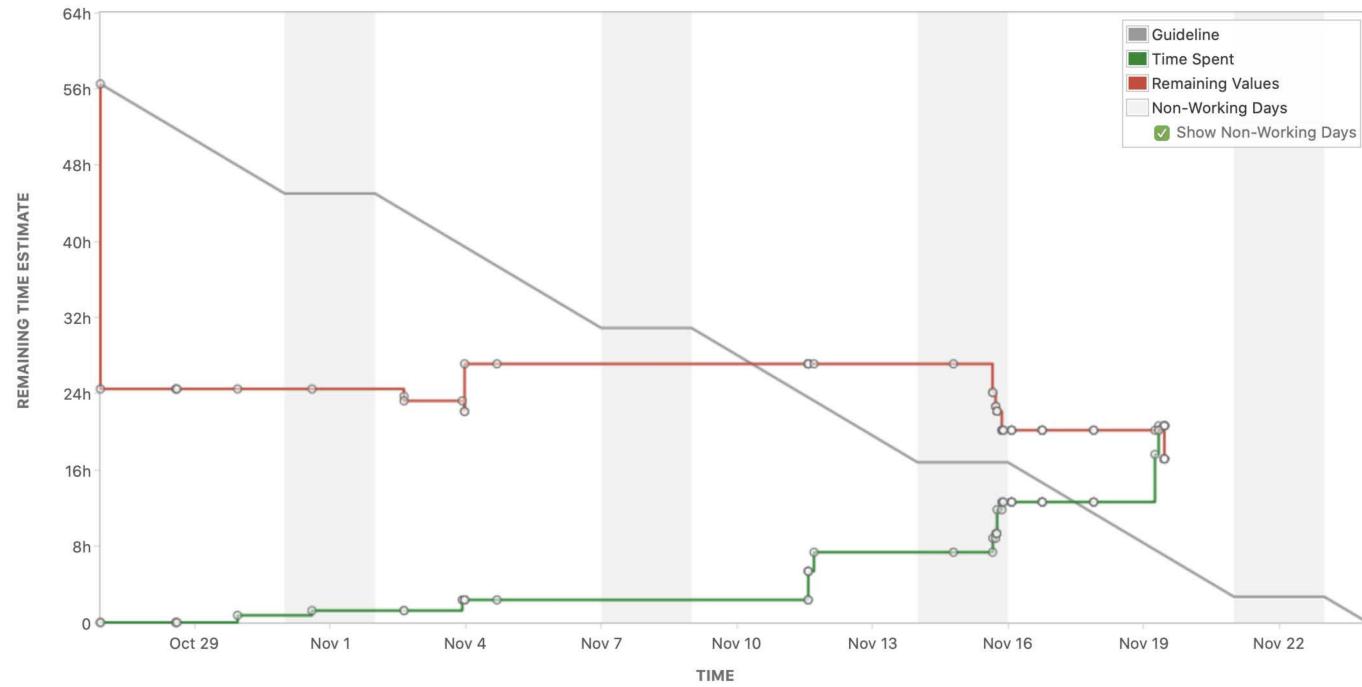
[View in Issue Navigator](#)



REVIEW OF SPRINT III (10/06 - 10/26)

REVIEW OF SPRINT IV (10/27 - 11/23) - TASKS

Completed Issues		View in Issue Navigator				
Key	Summary	Issue Type	Priority	Status	Story Points (39)	
HID-7	Upload ML algorithm code onto Jira Documents Page	<input checked="" type="checkbox"/> Task	↑ Highest	DONE	-	
HID-16	Develop Image Classification ML Algorithm	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-21	Create a video showing our MVP demo	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-23	Develop illness prediction image upload page	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-24	Develop illness result page	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-30	As a user, I want to be diagnosed by the SYMCheck web application so that I can gain a cursory understanding of what might be causing my symptoms/what the potential recommendations might be	<input type="checkbox"/> Story	↑ Medium	DONE	1	
HID-31	As a user, I want to upload a photo/image of my symptom/affected area/illness so that the SYMCheck application can diagnose me and I can gain insights as to what I might be afflicted with	<input type="checkbox"/> Story	↑ Medium	DONE	3	
HID-32	As a user, I want to be sure that my image has been uploaded successfully so that I can be sure that the image will be processed by the application so that I can receive recommendations for my care	<input type="checkbox"/> Story	↑ Medium	DONE	3	
HID-33	As a user, I want to submit my image for assessment so that I may receive a[n accurate] determination of my affliction as well as reccomendations for care	<input type="checkbox"/> Story	↑ Medium	DONE	8	
HID-34	As a user, I want to know if I am in a critical condition or in need of immediate medical attention so that I am able to seek medical care as soon as possible if there is no time to waste!	<input type="checkbox"/> Story	↑ Medium	DONE	1	
HID-35	As a user, I want to find the nearest emergency room so that I can seek immediate medical condition for what I deem to be an extremely critical/dire/time-sensitive condition	<input type="checkbox"/> Story	↑ Medium	DONE	3	
HID-37	As a user, I want to know what my symptoms indicate/what my affliction might be so that I can gain an understanding of what might be causing my symptoms, and thus make an informed decision	<input type="checkbox"/> Story	↑ Medium	DONE	5	
HID-38	As a user, I want to know what information I can obtain about this/any illness I might potentially have so that I can gain an understanding of what might be causing my symptoms, and thus make an informed decision on how best to go forth with my care	<input type="checkbox"/> Story	↑ Medium	DONE	5	
HID-39	As a user, I want to know whether or not I should see a doctor so that I can gauge how much of a PRIORITY a visit to a doctor/medical facility is based on the general nature of my symptoms/illness/affliction	<input type="checkbox"/> Story	↑ Medium	DONE	5	
HID-40	As a user, I want to find the nearest emergency room so that I can receive immediate medical attention if it is deemed necessary	<input type="checkbox"/> Story	↑ Medium	DONE	3	
HID-41	As a user, I want to receive another diagnosis for another affliction/repeat the diagnosis for this one so that so that I can upload another photo/set of symptoms for a different or the same illness (i.e. for confirmation of the latter)	<input type="checkbox"/> Story	↑ Medium	DONE	1	
HID-43	As a user, I want to be aware of the quality/accuracy of the results given relative to those from a medical facility/medical professional so that I do not forget that all results are simply cursory recommendations based on past data	<input type="checkbox"/> Story	↑ Medium	DONE	1	
HID-50	Create Deliverable 4 PowerPoint Presentation	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-51	Create a user manual for using SymCheck application	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-52	* Create installation guide for running our project on localhost	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-53	* Complete test cases with actual results	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-54	* Update GitHub page	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	
HID-55	* Finish draft technical paper	<input checked="" type="checkbox"/> Task	↑ Medium	DONE	-	



REVIEW OF SPRINT IV (10/27 - 11/23) - BURNDOWN CHARTS

TEST CASES



TEST CASES – HOMEPAGE

Test Case For	ID	Test Cases	Test Data	Expected Results	Actual Results	Pass/Fail
Homepage	I	Browse the Website		User should be able to access the homepage of the website	Once directed to site, you will first be directed to the homepage of SymCheck	P
		Locate the Get 2 Diagnosed Link		User should be able to locate the link to access the upload page	Click link Get Diagnosis Now to be redirected to upload page	P

TEST CASES – IMAGE UPLOAD

Test Case For	ID	Test Cases	Test Data	Expected Results	Actual Results	Pass/Fail
User Input Page	1	Locate the Submit Photo Link		User should be able to locate the link to submit photo	Next to the upload image button there is a button to submit the photo	P
	2	Choose file shows up		User should see choose file option, to upload photo to website	Once you click the choose file button you will be redirected to upload a file from your computer	P
	3	Drag and Drop feature		User can drag and drop the photo in the box for uploading	This feature will be completed in the next semester	F
	4	Ability to cancel uploading file		User should be able to cancel the file from being uploaded	When selecting the file to upload you are prompted with the option to cancel. If you click cancel the file won't upload to the page.	P
	5	Verify file is uploaded		User should not be able to click on the submit button without submitting a file	If you try to select the submit button without uploading an image, you are prompted to please select a file	P
	6	Verify file is correct		User should be promoted to verify uploaded file is correct	When uploading the file, the user can see what image they are uploading and cancel the process if it is not the right image.	P
	7	Submit to website for analysis		User should be able to click submit to send correct photo to be analyzed	Once uploading the image click the submit button and the algorithm begins analyzing the photo for results	P
	8	Locate the Nearest ER Link		User should be able to locate and click the Nearest ER link to access an interactive map	Under the logo, there is the Nearest ER link. Clicking this button, you can access google maps to show hospitals nearby.	P
	9	Return to Homepage Link		User should be able to return to the homepage when clicking the Home button	At the bottom of the page when clicking the home button, you are redirected to the homepage of Symcheck	P

TEST CASE – IMAGE FUNCTIONALITY

Test Case For	ID	Test Cases	Test Data	Expected Results	Actual Results	Pass/Fail
Image functionality	1	Check for image file extension		User can only upload certain types of file extensions (Verify if incorrect)	When uploading a file you can only open a jpg or png. No other extensions will be allowed to be uploaded	P
	2	Check for size of the image file		If file is too large to upload, the user must be notified	If file is too large, it will be resized to fit a specific measurement before being processed in the Machine Learning	P
	3	Check for height and width		Image should be measuring a certain height	Before preprocessing is done, the image is resized to be 200 length and 200 width. That way the images are processed at the same size.	P

TEST CASES – RESULTS

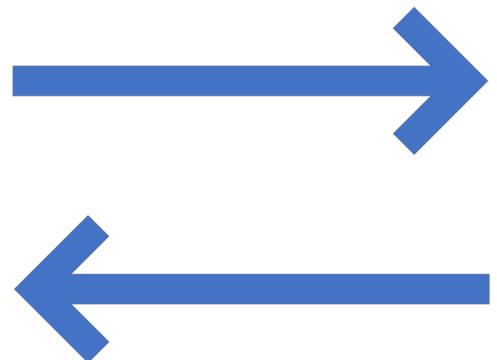
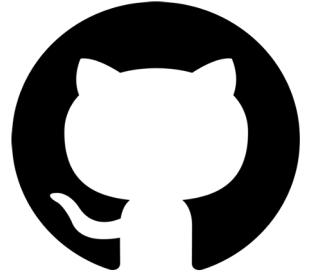
Test Case For	ID	Test Cases	Expected Results	Actual Results	Pass/Fail
Results	1 complete	Results appear after analysis	User will see percentage that they have the illness	In the Results box it displays the likely hood of the image being an illness.	P
	2 About the disease			If the image is likely to be Chickenpox or Pink Eye, then the About box will give information about the illness and a link to the CDC website. If the image is not likely to be chickenpox or Pink Eye, then the section will say that the algorithm isn't detecting an illness	P
	3 When to see a Doctor		User will see facts about the disease they have been diagnosed with	In the When To See A Doctor section, it will state when it is best advised to seek medical attention and includes the symptoms that can occur or become worse	P
	4 Nearest ER		User will see when it is best advised to see a doctor	Towards the bottom of the page there is a Nearest Emergency Room section. Where you can click the Nearest Emergency Room button and google maps pops up with Emergency Rooms nearby your location.	P
	5 New Diagnosis Link		If selected, user will be able to access an interactive map	In the top right corner there is a button called new diagnosis, where you will be redirected to the upload image page to upload a new image to diagnose	P
	6 Return to Homepage Link		User should be able to access the user input page for a new diagnosis	In the top left corner there is a Home button, when clicking this button you will be redirected to SymChecks homepage	P
	*7 Error Message		User should see an error message if there is any issue with their uploaded image.	If the user deletes their browser history and tries to refresh the page, the results won't exist anymore, and this will cause the user to submit photo again.	P

TEST CASES – FEEDBACK

Test Case For	ID	Test Cases	Test Data	Expected Results	Actual Results	Pass/Fail
Feedback	1	Send user feedback		User can click button to send feedback about application	Located at the bottom of the Results Page, there is a Feedback section. You can click Contact Us Here to send the team a message.	P
	2	Fill out feedback		User will be prompted to type their feedback about the application	Once the Contact Us Here was clicked you will be redirected to an email where the email address and subject are already filled out. All you have to do is fill out the message you would like to send.	P
	3	Submit Feedback		User can submit feedback and will have a response within 24 hours	Once the email is ready to be sent, the user can send the email and the team will respond back shortly.	P



PROJECT
DEMO



GITHUB WALKTHROUGH



RETROSPECTIVES

RETROSPECTIVES

What went well

- Completing our work on time
- Marking user stories as complete on Jira
- Communication among team members

What needs improvement

- Meeting times
- Coding redundancies

Next Steps

- Find a code collaboration tool
- Establish a better availability window for meetings



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CONCLUSION

CONCLUSION

Application Recap

- SymCheck facilitates the lives of users
- Currently diagnoses chickenpox and pink eye
- Provides:
 1. Model results
 2. Information on the illness
 3. Location of the nearest hospital

Future Scope

- Chatbox AI
- Textual symptom submission
- Adding other illnesses