THE HEALTHCARE AI HACKATHON

CELLSTRAT

Bangalore Medical College & Research Institute

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Team 14

Team Details

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Problem Statement

What is the challenge you're solving?

Frequent hospital visits and invasive procedures remain a major burden for children with urinary tract conditions. Many of these evaluations require catheterisation or voiding in **controlled clinical environments** using devices such as uroflowmeter. These procedures are often **uncomfortable**, **anxiety-provoking**, and logistically difficult for families. We are trying to find a **novel video based analysis of urinary stream**, measure Q max, monitor and diagnose various pediatric urinary conditions remotely and safely .

Why is the problem important?

Conventional uroflowmetry requires hospital visits. **Children feel anxious; adults feel embarrassed** .**Equipment is expensive and not available in many regions** .Results of these studies represent only a single moment, not everyday reality. **Mobility-limited patients** cannot perform the test easily. There is a growing need for noninvasive, home-based diagnostic modalities that can accurately assess urinary function without the stress of hospital settings. Such tools could transform the evaluation process by enabling real-time, natural-environment monitoring of voiding patterns. Innovations in video analysis and AI-based stream measurement could transform screening and diagnosis of various urinary conditions.

Who is affected and how?

children suffer with various **urinary conditions** like neurogenic bladder, urethral stricture, bladder outlet obstruction , meatal stenosis etc which need invasive and non invasive investigations in hospitals setting Beyond children, these technologies could also significantly benefit adults, elderly individuals, and patients with obstructive uropathy and mobility limitations who face challenges accessing traditional urological investigations.

Any data, numbers, or real-world context you can share?

LUTS is common and clinic uroflow is costly, uncomfortable, and often unreliable.
Video-based flow tracking is proven accurate, but no low-cost home solution exists in India - the gap we address.
Source: Palma PL et al., Healthcare (Basel), 2023.

Proposed Solution

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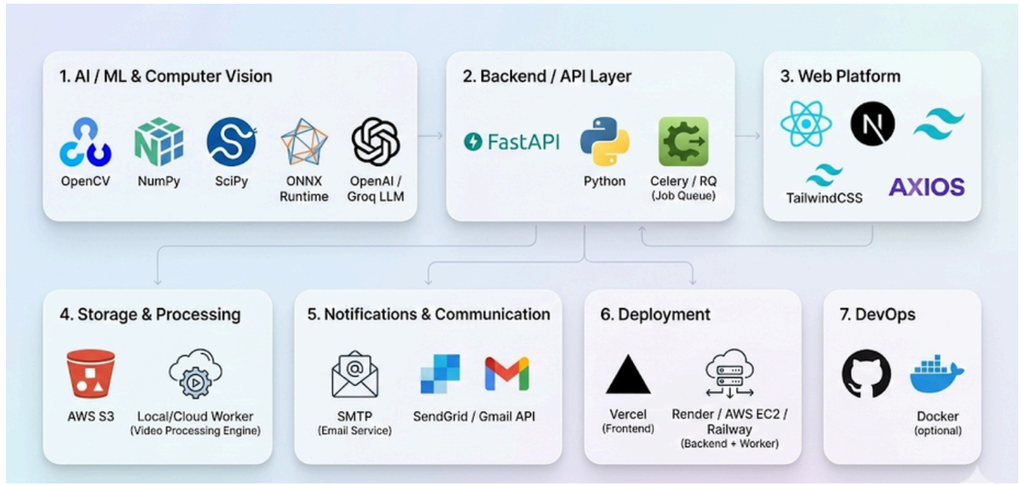
What solution are you building?

This video based monitoring and measurement of urinary stream can help in noninvasive diagnosis at comfort of their home not only in children but also adults with obstructive uropathy.

- Using a a simple smartphone camera we can
- Measures Qmax & flow pattern using AI.
- Non-invasive, natural voiding at home
- Affordable, accessible, and repeatable anytime
- Suitable for children, adults, elderly, and disabled patients

What technology stack are you using?

Key technologies, frameworks, or APIs you plan to use. Example: OpenAI, Groq, HuggingFace, LlamaIndex, Fast API etc.



OpenCV
NumPy
SciPy
ONNX / HuggingFace
OpenAI / Groq
FastAPI
Python
Celery / RQ
React

Next.js
TailwindCSS
Axios
AWS S3
SMTP / SendGrid
Vercel
Render / AWS EC2 / Railway
GitHub
Docker

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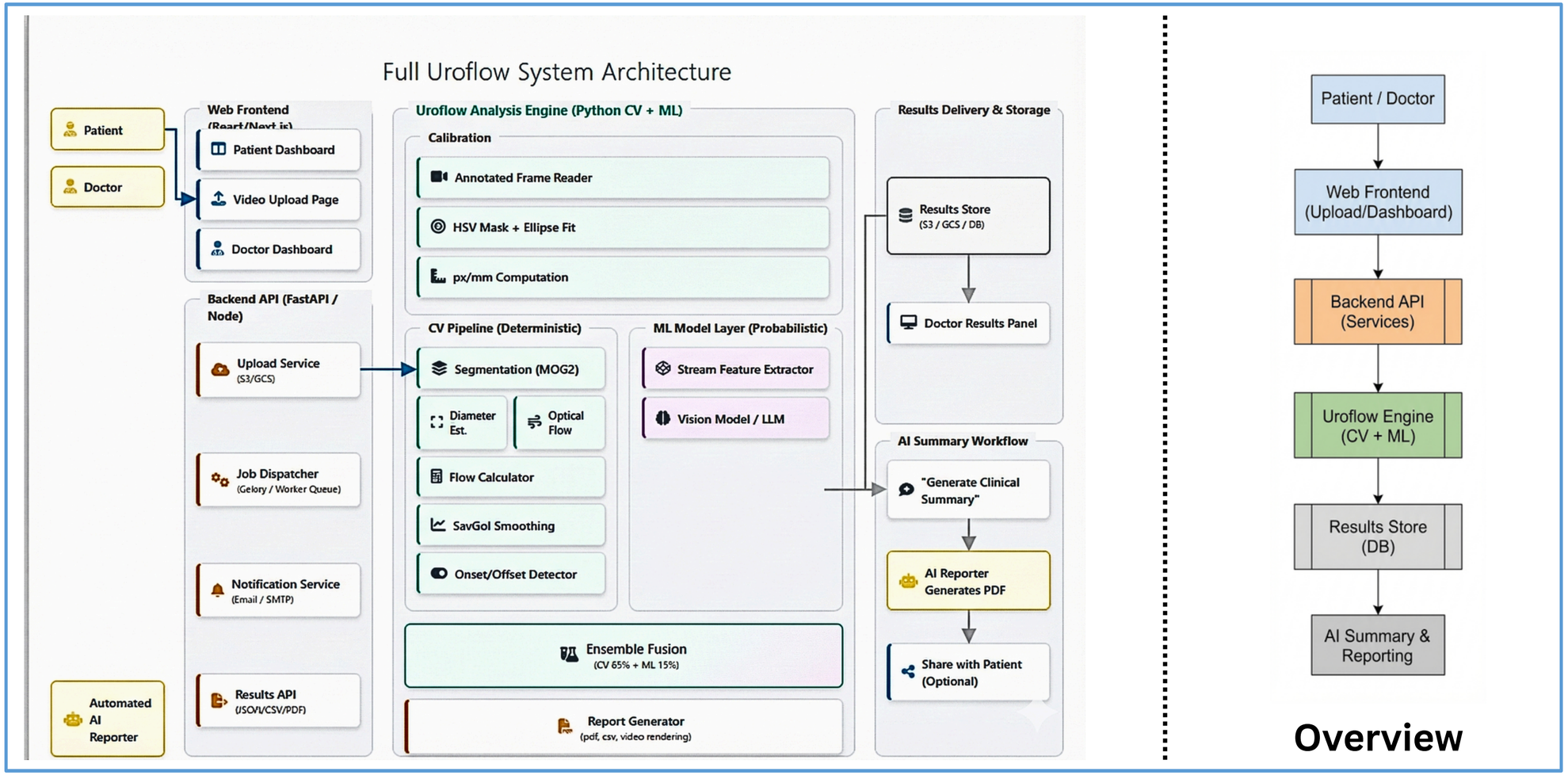
Proposed Solution

Add a visual: solution architecture, workflow sketch, etc.



Any datasets or resources you are using?

Our system's speciality is that it does not require any dataset or training.
All measurements come from deterministic computer-vision algorithms, making the output transparent, explainable, and clinically reliable.

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Impact & Readiness

What real-world impact could this solution create?

A. Transforming Care for Children
B. Improving Access and Equity
C. Early Diagnosis & Timely Intervention
D. Reducing Healthcare Costs
E. Continuous Monitoring for Chronic Conditions
F. Data-Driven, AI-Enabled Precision Care
G. Patient Empowerment & Comfort

Any cost savings, efficiency gains, or improved outcomes?

A. Fewer hospital visits
B. No need for expensive equipment
C standard uroflowmeter costs ₹1–3 lakh (or more).
D. Reduced need for repeated tests
E. No need for scheduling uroflow appointments

F. Earlier diagnosis
G. Better monitoring & treatment adjustment
I .More accurate assessment: Hospital uroflow can be misleading

Is your prototype ready?

Yes, prototype is ready .further enhancements are being done currently

Will you be able to demo or present it on Dec 7?

Yes

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Project Implementation Plan

Note: Provide a step-by-step breakdown of tasks and modules you will be implementing over the course of the hackathon (over the two-week long build phase). Mention the core functionalities to be developed.

PROVIDE GITHUB LINK HERE (CODE): *https://github.com/MadhankumarAI/Dockothon*