



# *Chroma*Lens

'Precision Color Recognition for the Colorblind'

**Empowering 300 million people worldwide with instant, precise color identification through intelligent desktop tools that work seamlessly across digital and physical environments.**

# Meet Our Team



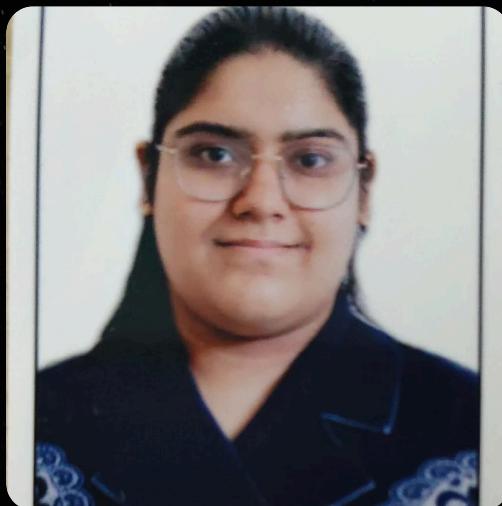
**Divam Gupta**

1st year



**Achintya Mathur**

1st year



**Aarushi Anand**

1st year



**Parv Jain**

1st year

# Understanding the Challenge

- Colorblind users face significant challenges with accurate color identification in daily life and professional settings.
- Existing solutions often rely on full-screen filters, leading to visual distortion and a compromised user experience.
- There's a critical lack of tools offering precise, on-demand color information without altering the entire display.

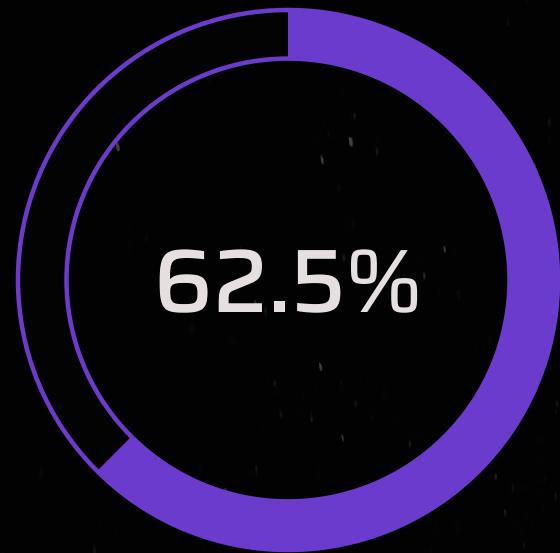


# Problem Statement

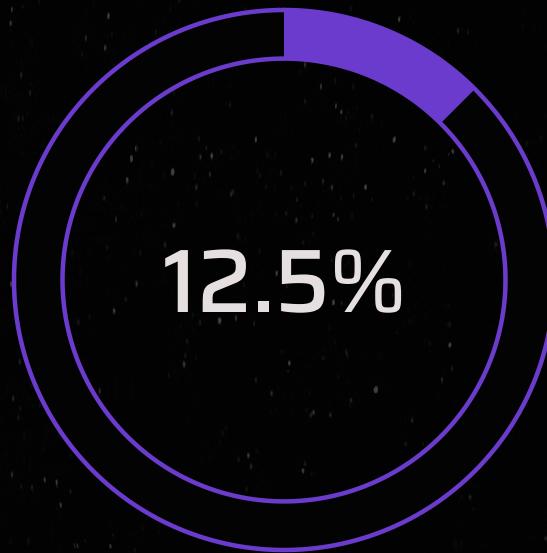
Most colorblind tools miss the point. They slap a filter across your entire screen, warping everything. But if you're colorblind, you don't want distortion — you want precision. Imagine a UI designer who can't tell if their button is blue or purple, or a trader unsure whether a ticker is red or green. Right now, their only options are clumsy hacks, endless guessing, or asking for help. That's not accessibility — that's a productivity killer.

**"We don't need correction; we need clarity."**

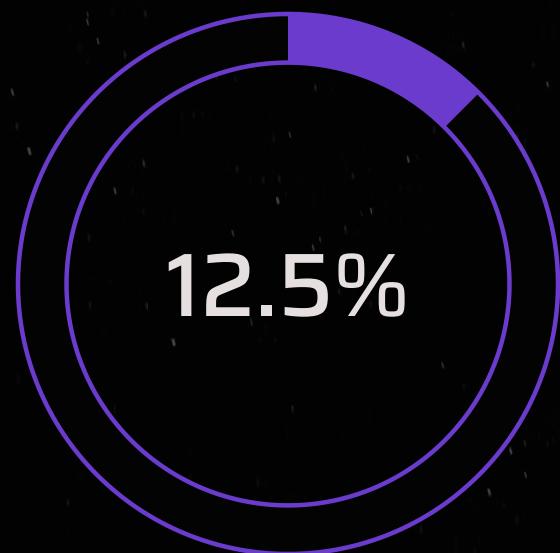
# The Hidden Crisis: 300 Million People Left Behind



Deuteranomaly (Green-Weak): Most common form.



Protanomaly (Red-Weak)



Deutanopia (Green-Blind)



Protanopia (Red-Blind)

These conditions significantly impact daily life and professional performance, highlighting the urgent need for targeted solutions.

# User Challenges: Everyday Hurdles



## Interpreting Color-Coded Information

Graphs, charts, maps, and infographics often rely solely on color to differentiate key data, making them inaccessible.



## Complicating Daily Tasks

Seemingly simple activities like shopping for clothes, cooking, or even selecting ripe produce become complicated and frustrating.



## Navigating Digital Content

Modern interfaces frequently use red-green status indicators, color-only hyperlinks, or subtle icon color changes for notifications, causing significant confusion.



## Barriers in Education

Color-coded educational materials and subjects like chemistry or biology become difficult, often leading to misdiagnosed struggles.

# The Daily Struggle: Where Current Solutions Fail !

For millions of professionals, distinguishing colors in critical dashboards or design software is a daily struggle. Existing tools often add more confusion than clarity.



## Professional Limitations

Designers misinterpreting palettes, analysts misreading charts, and developers struggling with interfaces. Inaccessible tools limit career growth.



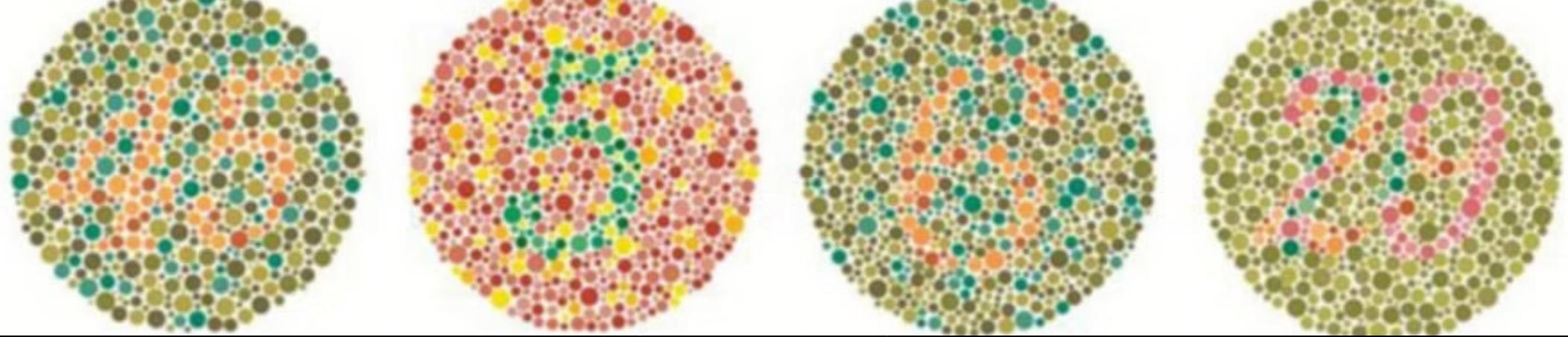
## Flawed Current Solutions

Existing tools use clumsy, full-screen filters that distort displays, creating more confusion. They fail to provide precise color identification.



## Information Ambiguity

Color-coded indicators, warnings, and data become ambiguous, leading to mistakes, frustration, and exclusion from essential digital experiences.



# Existing Solutions and Their Limitations

While various tools exist to aid individuals with color vision deficiencies, they often fall short in providing a comprehensive and practical solution for everyday use. Understanding these limitations highlights ChromaLens's unique value proposition.



## Screen Overlays & Filters

Apply system-wide color adjustments, often distorting other colors and making general screen usage uncomfortable or inaccurate.



## Basic Identifier Apps

Provide only generic color names (e.g., "red," "blue") and lack the precision or contextual understanding needed. Mostly digital-only.



## Specialized Glasses & Charts

Glasses alter overall perception and are limited to physical environments. Manual charts are tedious and impractical for real-time use.



## Overall User Experience

Most solutions are clunky, slow, or lack specific color data (HEX, RGB) and contextual information, leading to user frustration.

ChromaLens addresses these critical gaps, offering a precise, versatile, and user-friendly experience that empowers individuals to navigate a colorful world with confidence and clarity.

# Introducing ChromaLens: Intelligent Color Recognition

## Clarity, Not Just Correction

ChromaLens represents a fundamental shift in accessibility technology. Instead of altering the entire visual experience, we provide on-demand, precise color identification that empowers users with the exact information they need, when they need it.



### Lightweight Integration

Works seamlessly across all desktop applications without requiring system-wide changes or visual distortions.



### Intelligent Recognition

Advanced algorithms provide human-readable color names, not just hex codes or technical specifications.



### Multi-Environment Support

Functions across most digital interfaces and moving towards supporting multiple platforms in the future.



## ChromaLens

Color Accessibility Tools

### Color Inspector

Instantly identify any color on the screen.

Inspect Color



Speak color names



### Real-World Vision

Point your camera at any object to identify its color in real-time.

Start Camera

# All the features :

## **Color Inspector**

Instantly identify any color on the screen.

**Inspect Color**

 Speak color names

## **Real-World Vision**

Point your camera at any object to identify its color in real-time.

**Start Camera**

## **Colorblind Filter**

Apply colorblind filters to specific areas of the screen to simulate different types of color vision.

Filter Type

Protanopia (Red-blind)

Deutanopia (Green-blind)

Tritanopia (Blue-blind)

**Start Filter**

# Core Feature 1: *Color Inspector*

## Cursor-Based Color Identification

Simply hover your mouse over any element on the screen and click to instantly identify the color.



## Intuitive Color Names

Get human-readable color names instead of just RGB or hex codes, making it easy to understand the colors.



## Unobtrusive Display

The color information appears in a clean, minimal overlay that won't distract you. We even convert the color name to speech so you can hear it as well.

# Core Feature 2: *Real world Vision*



## Instant Recognition

Point your device at any object for immediate color identification, even in challenging lighting.



## Contextual Understanding

Beyond basic names, ChromaLens provides descriptive color names like "deep forest green" or "sunflower yellow."



## Customizable Feedback

Choose between audio, on-screen text, or haptic feedback to tailor your experience.



## Offline Capabilities

Core identification features work seamlessly offline, ensuring reliability anywhere.

# Core Feature 3: *Colorblind Filter*



## Enhanced Digital Comprehension

ChromaLens seamlessly integrates to help users understand and distinguish colors on screens— websites, apps, images, and videos. Essential for professional tasks and digital consumption.



## Pixel-Perfect Accuracy

Proprietary technology offers precise color identification, providing HEX, RGB, CMYK values, and descriptive names. Invaluable for designers, developers, and anyone needing detailed color information.



## Data Visualisation Interpretation

Aids data analysts, students, and professionals in interpreting complex color-coded charts, graphs, and infographics. Eliminates ambiguity in data visualization.



## Confident Online Shopping

Eliminate online shopping uncertainty. Confirm true product colors, ensuring selections match expectations and needs, reducing returns and enhancing satisfaction.

This feature ensures that the digital world is as accessible and understandable as the physical one, providing a holistic solution for color vision deficiencies.

# Tech Stack Used



## Chrome Extension Manifest V3

Utilizing the latest extension platform for enhanced security, performance, and modern browser compatibility.



## JavaScript ES6+

Leveraging modern JavaScript features like classes, async/await, and arrow functions for clean and efficient code.



## HTML5

Implementing semantic markup, the Canvas API for drawing graphics, and Video elements for rich media experiences.



## CSS3

Styling with custom properties, Flexbox, Grid, and media queries for responsive and visually appealing interfaces.



## Pico.css

A lightweight CSS framework used for rapid prototyping and ensuring a consistent, accessible design with minimal overhead.

# Tech stack used - API's

ChromaLens leverages various browser and web APIs to power its precise color recognition and smooth user experience, integrating core features for both digital and real-world interactions.



## EyeDropper API

This API allows users to pick any color directly from their screen. It's crucial for accurate, on-demand color identification without changing what's displayed.

**Built Features:** Powers the 'Color Inspector', enabling precise digital color sampling by hovering and clicking.



## Speech Synthesis API

This API converts color names into spoken words, making it more accessible for users.

**Built Features:** Provides audio feedback for identified colors, enhancing the 'Color Inspector' and 'Real world Vision' features.



## Chrome Extension APIs

These APIs help ChromaLens function seamlessly as a browser extension, capturing screen content and displaying color information overlays.

**Built Features:** Facilitates the 'Colorblind Filter' for enhanced digital comprehension, pixel-perfect accuracy, data visualization interpretation, and confident online shopping directly within the browser.



## MediaDevices API

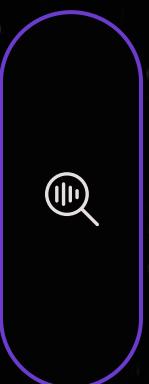
This API allows ChromaLens to access camera input from the user's device.

**Built Features:** Essential for the 'Real world Vision' feature, enabling instant color recognition from physical objects through live camera feed.



# Competitive Advantage: Why ChromaLens Stands Out

ChromaLens isn't just another accessibility tool; it's a paradigm shift in how colour vision deficiency is addressed. We move beyond generic overlays to offer a sophisticated, targeted solution.



## Not Another Generic Overlay

Unlike existing solutions that apply blanket filters across entire screens, ChromaLens provides targeted, precise information exactly where and when users need it. There's no visual distortion or system-wide changes, just intelligent, on-demand assistance.



## Built for Precision Moments

ChromaLens is designed specifically for those critical instances when users need to know, "What exact colour is this, right now?" Whether it's reviewing design mockups, analysing data visualisations, or making critical purchasing decisions, our precision is unmatched.



## Dual-Environment Innovation

We are the first accessibility tool to seamlessly work across both digital interfaces and physical environments. ChromaLens provides comprehensive colour identification capabilities that adapt to users' complete daily experiences, offering a truly integrated solution.



## Demo-Ready Impact

The transformative difference ChromaLens offers can be witnessed within 30 seconds of demonstration. The immediate, tangible benefits are evident and compelling, making the value proposition undeniably clear and impactful.

ChromaLens delivers a focused, accurate, and versatile experience that existing solutions simply cannot match, establishing a new benchmark for colour accessibility.

# Future Enhancements: The Road Ahead

Our commitment to innovation means ChromaLens will continuously evolve to meet the growing needs of our users. We have a robust roadmap of enhancements designed to expand functionality, improve user experience, and integrate with emerging technologies.



## Augmented Reality Integration

Future versions will integrate with AR glasses, providing heads-up display colour identification and real-time overlays for an even more immersive and hands-free experience.



## Advanced AI for Context

We will leverage more sophisticated AI to provide deeper contextual understanding, such as identifying if a "red" object is an apple, a fire truck, or a warning sign, and offering relevant safety information.



## API for Developers

An open API will allow developers to integrate ChromaLens's powerful colour identification capabilities into their own applications, fostering a broader ecosystem of accessible technology.



## Multilingual Support Expansion

Expanding our linguistic support to cover more global languages and regional dialects, ensuring ChromaLens is accessible and intuitive for users worldwide.



## Enhanced Color Filter Accuracy

We aim for medically accurate color correction for specific types of color blindness, leveraging more detailed data and mathematical matrices for precise color filtering.

These enhancements will ensure ChromaLens remains at the forefront of accessibility technology, continuously pushing the boundaries of what's possible for individuals with color vision deficiencies.

# Thank You!

We sincerely appreciate you taking the time to learn about ChromaLens and our vision for a more colorful and accessible world. Your support helps us empower individuals with color vision deficiencies to experience every hue.

For any questions or further information, please feel free to reach out.