GOPALAN
COLLEGE OF ENGINEERING
AND MANAGEMENT
Whitefield, Bengaluru

Project Report

Title

Design and Development of an Indian Parakeet Feeding Model for Hand-Rearing and Rehabilitation of Abandoned Chicks at PFA Wildlife Hospital, Bengaluru

---

1. Introduction

The rescue and rehabilitation of abandoned Indian parakeet chicks present significant challenges, particularly during the early stages of hand-feeding and behavioural conditioning. At PFA Wildlife Hospital, Bengaluru, approximately **46 rescued parakeet chicks** required continuous hand-feeding while ensuring minimal human imprinting and maximum comfort to mimic motherly care.

To address this requirement, the **Department of Aeronautical Engineering, Gopalan College of Engineering and Management (GCEM)** undertook the design and development of a **cost-effective, maintainable, and biologically sensitive feeding model** that could simulate natural feeding behavior and improve chick confidence for eventual rehabilitation into the wild.

---

2. Project Initiation and Stakeholders

- **Project Request Received From:**
  - *Mrs. Sunita Prabhakar*, Director, Gopalan Foundation
  - Through *Col. Nawaz Shariff*, General Manager, PFA Wildlife Hospital, Bengaluru
- **Date of Initial Call:** *16 January*
- **Implementing Team:**
  - Department of Aeronautical Engineering, Gopalan College of Engineering and Management (GCEM)
- **Leadership & Coordination:**
  - **Dr. G. Purushotham**
    Head of the Department, Aeronautical Engineering, GCEM
- **Project Lead & Product Developer:**
  - **Prof. Suprith M**
    Assistant Professor, Department of Aeronautical Engineering
- **Laboratory & Technical Support:**
  - **Mr. Shubash**, Lab Instructor
  - **Mr. Rakesh R**, Lab Instructor
  - **Mr. Mani S**, Lab Instructor
- **Student Design & Fabrication Team (Final Year – Aeronautical Engineering):**
  - **Mr. Chakradhar D**
  - **Mr. Varun**

- **End User & Clinical Feedback Team:**
  - Veterinarians and animal care staff at PFA Wildlife Hospital, Bengaluru

---

3. Problem Statement

Hand-feeding rescued parakeet chicks using conventional syringes leads to:

- Increased stress in chicks due to direct human interaction
- Lack of motherly visual and tactile cues
- Risk of improper feeding posture and timing
- Reduced confidence during later-stage rehabilitation

Hence, there was a critical need for a **feeding aid that mimics maternal feeding**, is **safe**, **low-cost**, **easy to sterilize**, and **adaptable using locally available resources**.

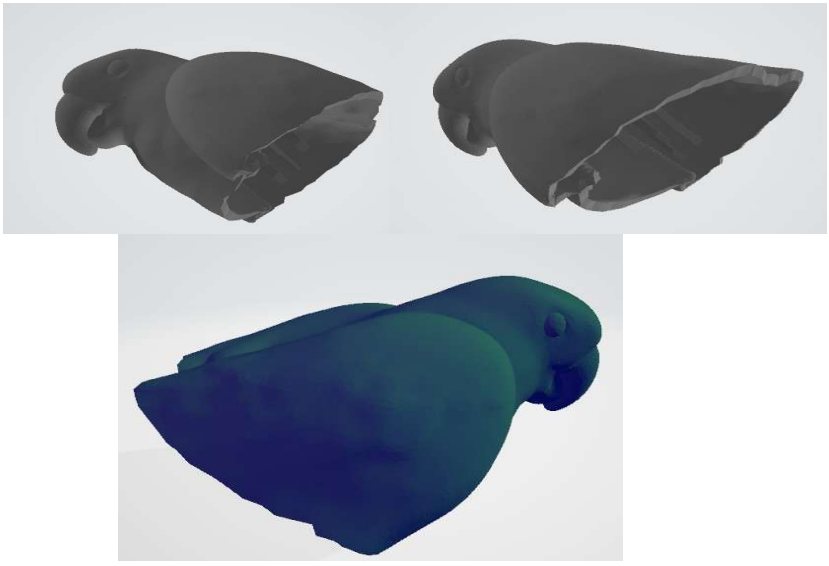
---

4. Objectives of the Project

- To design a **biomimetic feeding model** resembling an Indian parakeet
- To integrate **existing feeding tools** (syringes and feeding needles)
- To reduce stress and improve feeding acceptance among chicks
- To ensure **cost-effectiveness** and **ease of maintenance**
- To enable rapid prototyping and iteration based on veterinary feedback

---

5. Design and Development Process



5.1 Conceptual Design

The initial concept involved:

- A **parakeet-shaped puppet model**
- Integration of a **manual syringe-based feeding mechanism**
- Controlled feed delivery synchronized with chick response

5.2 Prototype – Version 1

- **Development Date:** *27 January*
- **Method:**
  - Integration of mechanical linkages to an existing puppet
  - Attachment to standard syringes and feeding needles
- **Testing:**
  - Conducted using a dummy setup
- **Outcome:**
  - Functional but required refinement based on veterinarian observations

---

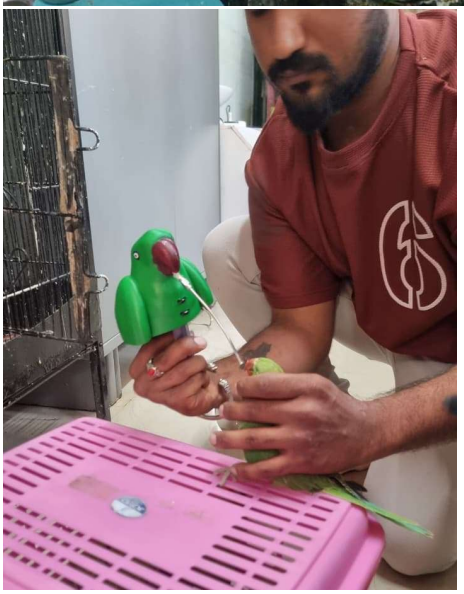
6. Feedback and Iterative Improvement

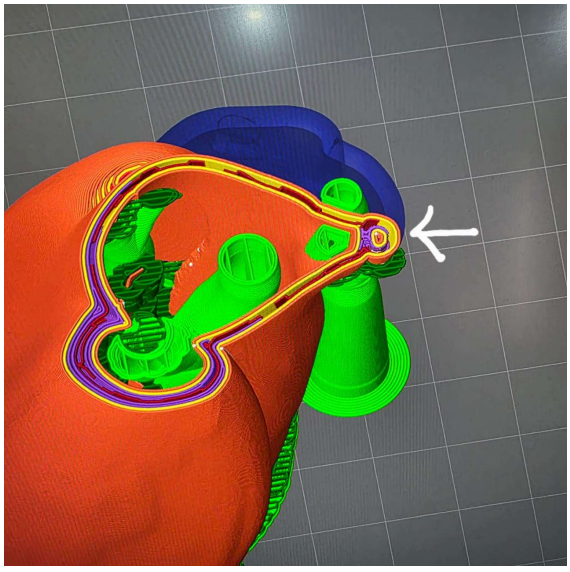
Based on expert feedback from PFA veterinarians:

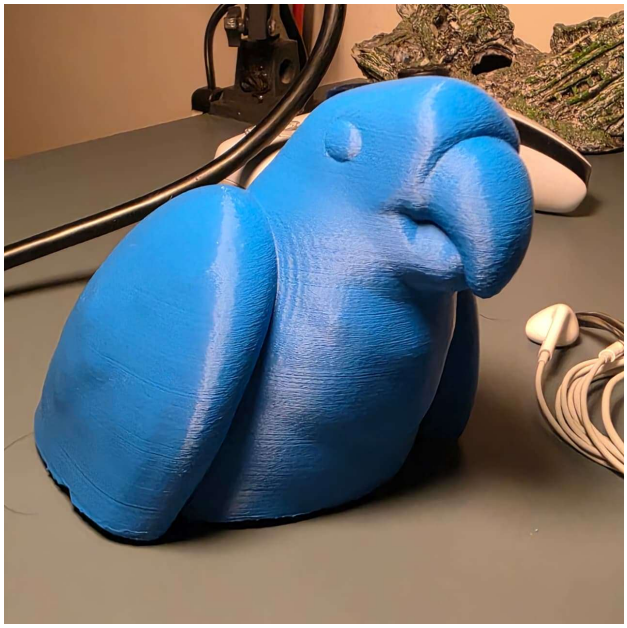
- Improved beak geometry and alignment
- Enhanced grip and stability during feeding
- Reduced external human visibility
- Smoother feed flow control

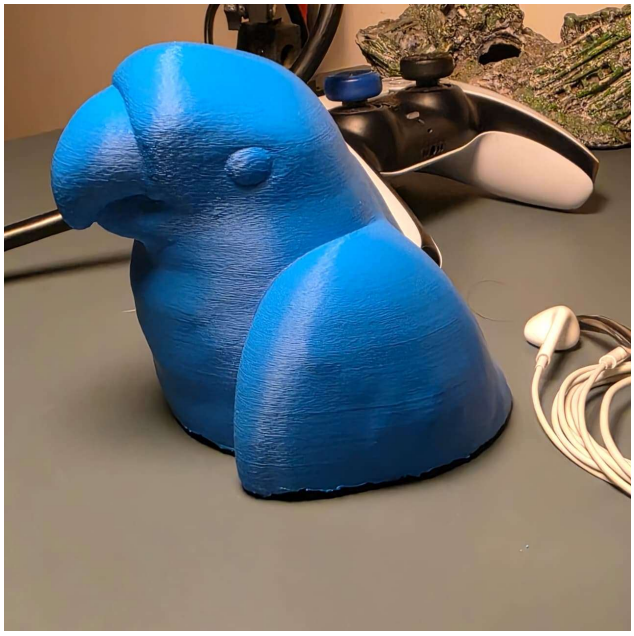
7. Prototype – Version 2 (Final Model)

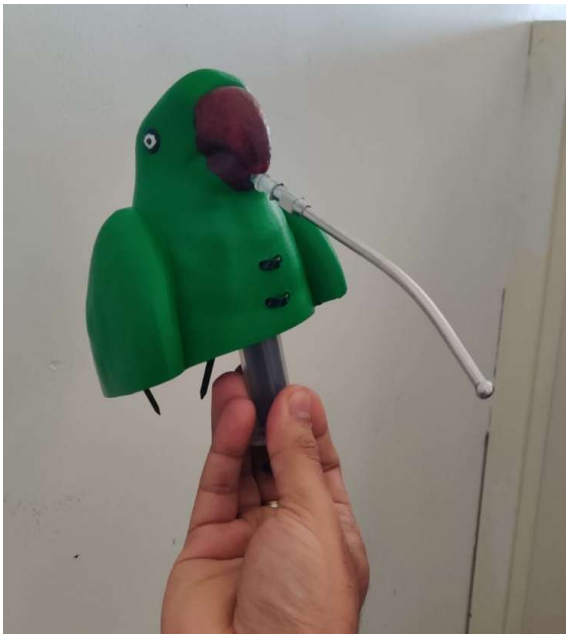
- **Design Approach:**
  - Fully **novel CAD design** tailored to Indian parakeet morphology
  - Optimized internal channels for syringe integration
- **Manufacturing Technique:**
  - **3D Printing** using lightweight, safe, and sterilizable material
- **Testing Date:** *7 February*
- **Testing Location:**
  - PFA Wildlife Hospital, Bengaluru
- **Results:**
  - Successfully accepted by parakeet chicks
  - Improved feeding response and reduced stress
  - Highly appreciated by veterinarians and care staff











8. Key Features of the Developed Model

- Biomimetic parakeet head and beak design
- Compatibility with standard syringes and feeding needles
- Modular and replaceable components
- Low-cost fabrication using available resources
- Easy cleaning and maintenance

- Scalable for multiple chicks

---

9. Impact and Outcomes

- Enabled **safe and effective feeding** of ~46 rescued parakeet chicks
- Helped in **building confidence** and natural feeding behavior
- Supported **rehabilitation readiness** of chicks for wildlife release
- Demonstrated the role of **engineering solutions in wildlife conservation**

---

10. Social and Institutional Significance

This project reflects:

- Strong collaboration between **academia, wildlife NGOs, and philanthropic organizations**
- Application of **aeronautical design thinking** to real-world humanitarian and ecological problems
- Commitment of GCEM and Gopalan Foundation toward **social responsibility and sustainability**

---

11. Attachments

11.1 Videos and Photos – Google Drive Link

- **Drive Link:**

Parakeet

---

12. Conclusion

The successful development and deployment of the Indian parakeet feeding model stand as a testament to interdisciplinary innovation and compassionate engineering. The solution not only addressed an urgent wildlife rehabilitation challenge but also set a precedent for future collaborations between engineering institutions and wildlife care organizations.

---

13. Acknowledgements

- PFA Wildlife Hospital, Bengaluru
- **Mrs. Sunita Prabhakar**, Director, Gopalan Foundation
- **Col. Nawaz Shariff**, GM, PFA Wildlife
- Veterinarians and animal care staff at PFA Wildlife Hospital
- **Dr. Arun Vikas Singh**, Principal, Gopalan College of Engineering and Management
- **Dr. G. Purushotham**, Head of the Department, Aeronautical Engineering, GCEM
- Lab Instructors: **Shubash**, **Rakesh R**, **Mani S**
- Final Year Student Contributors: **Chakradhar D**, **Varun**
- Department of Aeronautical Engineering, Gopalan College of Engineering and Management

---

Prepared by:
Prof. Suprith M
Assistant Professor & Product Developer
Department of Aeronautical Engineering
Gopalan College of Engineering and Management