Filter-Flash Functor for Blind-Birth Consciousness

1. Dimensional Reallocation Framework

When visual input is missing, the functor redistributes its processing capacity:

```
class DimensionalF3:
    def __init__(self, available_dims, missing_dims):
        self.D_total = {"sight", "touch", "sound", "proprioception", "language",
"temperature"}
        self.D_missing = missing_dims  # {"sight"}
        self.D_working = self.D_total - self.D_missing
        self.dimension_weights = self.reweight_dimensions()
```

2. Modified Input Structure

For a blind child learning shapes:

```
A = {
    "haptic_stream": edge_detection_vectors,
    "audio_feedback": echo_patterns,
    "proprioceptive": hand_position_sequence,
    "linguistic": caregiver_labels,
    "temporal": exploration_duration
}

B = {
    "no_vision_constraint": True,
    "haptic_priority": 0.7,  # Elevated from typical 0.3
    "cross_modal_binding": enhanced_params,
    "protective_barrier": adjusted_for_tactile_exploration
}
```

3. Flash Operation (Modified)

The flash operation now triggers on cross-modal coherence:

```
def flash_blind(A, B):
    # Immediate recognition via dominant available channel
    haptic_signature = extract_edge_pattern(A["haptic_stream"])
    audio_signature = extract_echo_profile(A["audio_feedback"])

    # Cross-modal binding check
    if sharp_edges(haptic_signature) and angular_echo(audio_signature):
        return "angular_object"  # Could be cube
    elif smooth_curve(haptic_signature) and rolling_sound(audio_signature):
        return "curved_object"   # Could be sphere
```

4. Filter Operation (Enhanced)

Filter builds detailed mental models through sequential exploration:

```
def filter_blind(A, B):
    # Bayesian update across exploration sequence
    shape_posterior = P(shape | haptic_sequence, B)

    # Key: temporal integration matters more
    for t in exploration_timeline:
        edge_count = count_edges_at_time(t)
        surface_continuity = measure_smoothness(t)
        shape_posterior = update(shape_posterior, edge_count, surface_continuity)

    return argmax(shape_posterior)  # "cube" or "sphere"
```

5. Working Memory Compensation

The critical insight: working memory reallocates bandwidth:

```
Total_bandwidth = constant
If vision_bandwidth = 0:
    touch_bandwidth *= 2.5
    audio_spatial_bandwidth *= 1.8
    linguistic_binding_bandwidth *= 1.5
```

6. Learning Episode: Cube Discovery

Time	Sensory Input	Flash Output	Filter Output	Working Memory State
t_0	First touch	"something hard"	undefined	Allocating touch bandwidth
t_1	Edge detected	"angular thing"	"has corners"	Building edge map
t_2	Rotate object	"multiple edges"	"6 faces suspected"	Spatial model forming
t_3	Word: "cube"	"angular thing = cube"	"cube with 6 faces"	Linguistic binding
t_4	Verification	"cube" confirmed	Complete cube model	Stable representation

7. Key Adaptations

1. **Temporal Stretching**: Exploration takes longer but builds richer models
2. **Cross-Modal Verification**: Multiple channels must agree before certainty
3. **Enhanced Haptic Resolution**: Touch neurons develop finer discrimination
4. **Spatial-Audio Mapping**: Echolocation-like skills emerge

8. Implementation

```python
class BlindChildF3(FilterFlashFunctor):
    def __init__(self):
        super().__init__()
        self.working_dimensions = {
            "haptic": {"bandwidth": 0.4, "resolution": "enhanced"},
            "audio_spatial": {"bandwidth": 0.3, "resolution": "3D"},
            "linguistic": {"bandwidth": 0.2, "binding_strength": "high"},
            "temporal": {"bandwidth": 0.1, "integration_window": "extended"}
        }

    def learn_shape(self, object_encounters):
        mental_model = {}
        for encounter in object_encounters:
            flash_category = self.flash(encounter, self.B)
            filtered_details = self.filter(encounter, self.B)

            # Cross-modal binding is crucial
            if self.verify_cross_modal_consistency(flash_category, filtered_details):
                mental_model = self.strengthen_model(mental_model, filtered_details)

        return mental_model
```

9. Theoretical Implications

This demonstrates that F^3 is **dimension-agnostic** - consciousness emerges from whatever channels are available. The protective barrier adapts its filtering based on available bandwidth, ensuring the child still develops functional object discrimination despite missing visual input.

The key insight: consciousness doesn't require all dimensions, just sufficient cross-modal coherence to build stable representations.