Multi-Level Context Map Generator

Usage Instructions for Handoff

Conceptual Framework: This visualization uses **elliptical coordinates** derived from polar coordinates (r, ϕ) at each stage to map concepts across abstraction levels. The circular coordinates are transformed into a flat oval shape to provide more horizontal space for text:

- **Radius** r: Abstraction level (center = high abstraction, outer rings = lower abstraction/specific implementations)
- **Angle** ϕ: Aspect or dimension of the central concept
- **Coordinate transformation**: $(r, \phi) \to (r\cos\phi \cdot s_x, r\sin\phi \cdot s_y)$ where $s_x = 1.4$ (horizontal stretch) and $s_y = 0.8$ (vertical compression) create a flat oval layout
- **Visual style**: Nodes have no borders or backgrounds for a clean, minimal appearance
- **Progression**: Each level zooms into a concept from the previous level, making it the new center

How to Extend:

1. **Add a new level**: Pick any medium-to-low radius concept from the current level
2. Make it the **new center** of the next level
3. Define 6–8 **aspects** (angular positions) related to this concept
4. For each aspect, place labels at different **radii** (abstraction levels):
   - Center ($r = 0$): Central concept
   - Medium radius ($r = 2.6$): Intermediate concepts
   - Outer radius ($r = 5$): Concrete implementations/specifics

Customization Guide:

- Modify `\drawContextLevel` parameters: center text, petal labels, outer labels
- Adjust `petalRadius` (default: 2.6), `outerRadius` (default: 5) for sizing
- Change `numPetals` (default: 8) for more/fewer aspects
- Adjust `ellipseStretchX` (default: 1.4) and `ellipseStretchY` (default: 0.8) to modify the oval shape
- Connect levels with curved arrows showing progression
- Note: All nodes are borderless and backgroundless by design

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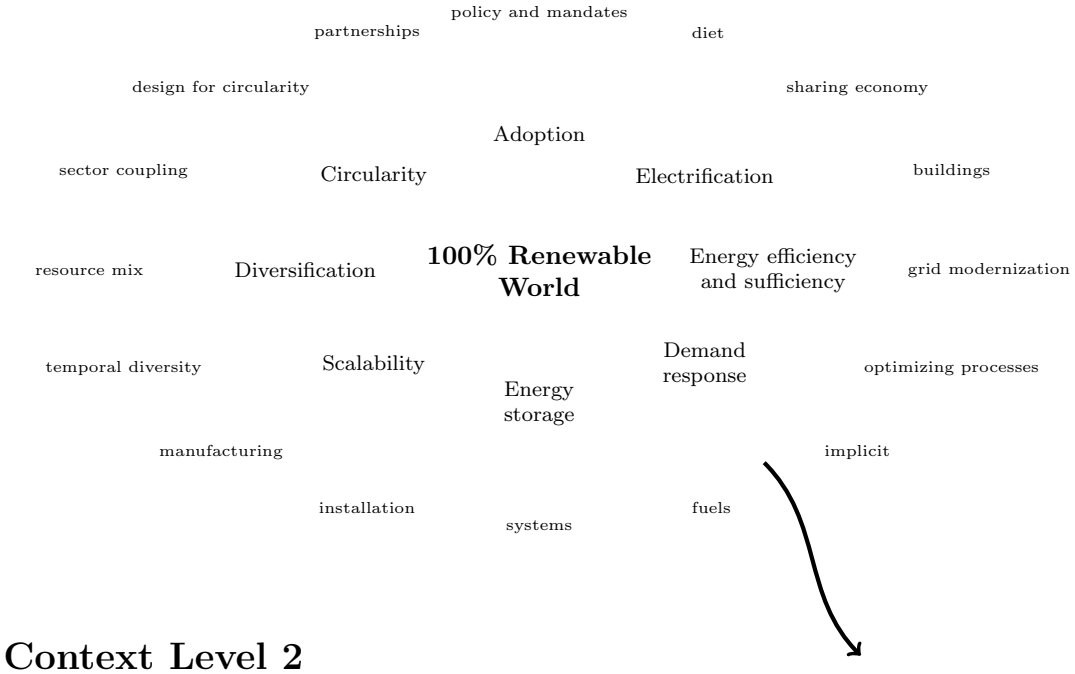
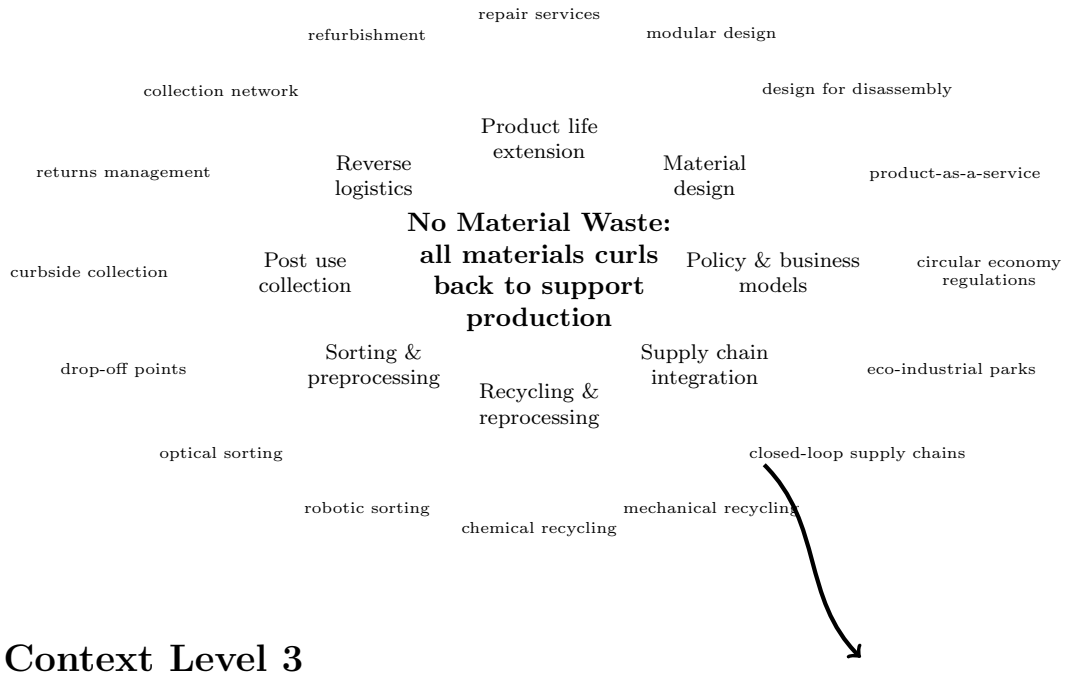
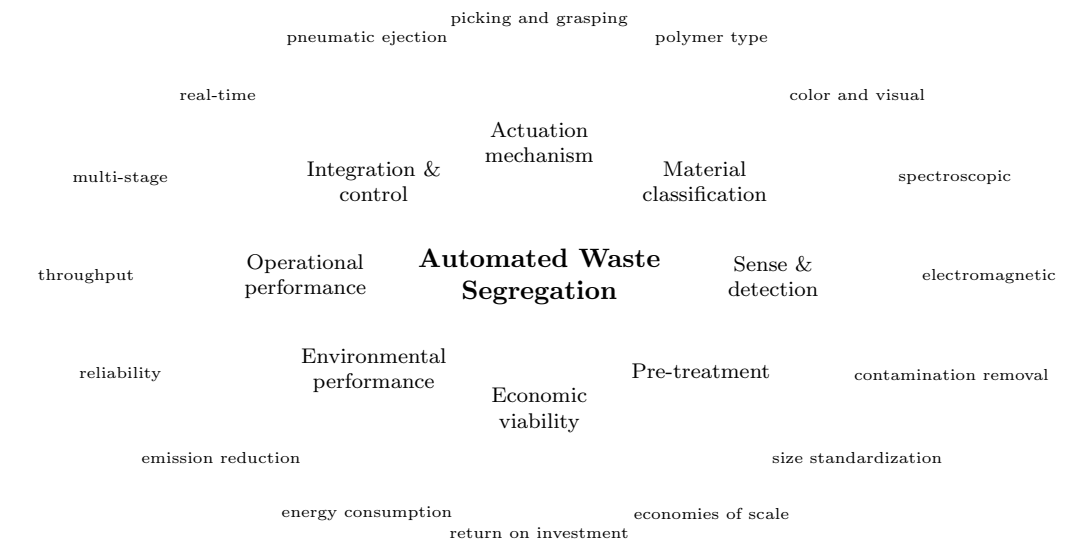
Context Level 1



Context Level 2



Context Level 3



Template for Adding Level 4

```
% Choose a concept from Level 3 (e.g., "Material classification")
\drawContextLevel{x-position}{y-position}{Material\\classification}{
    0/Computer\\vision,
    1/Spectral\\analysis,
    2/Machine\\learning,
    3/Database\\systems,
    ... (add 4-8 aspects)
}{
    0/RGB imaging,
    0.5/hyperspectral,
    1/NIR spectroscopy,
    ... (add outer detail labels at various angles)
}
```

Key Principle: Each level represents a **zoom-in operation**—taking a specific concept and exploring its constituent aspects and implementation details. The elliptical coordinate structure ensures both breadth (different aspects via angles) and depth (abstraction levels via radius) are captured simultaneously, with the flat oval layout optimized for text readability.