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 ($r = 4$): 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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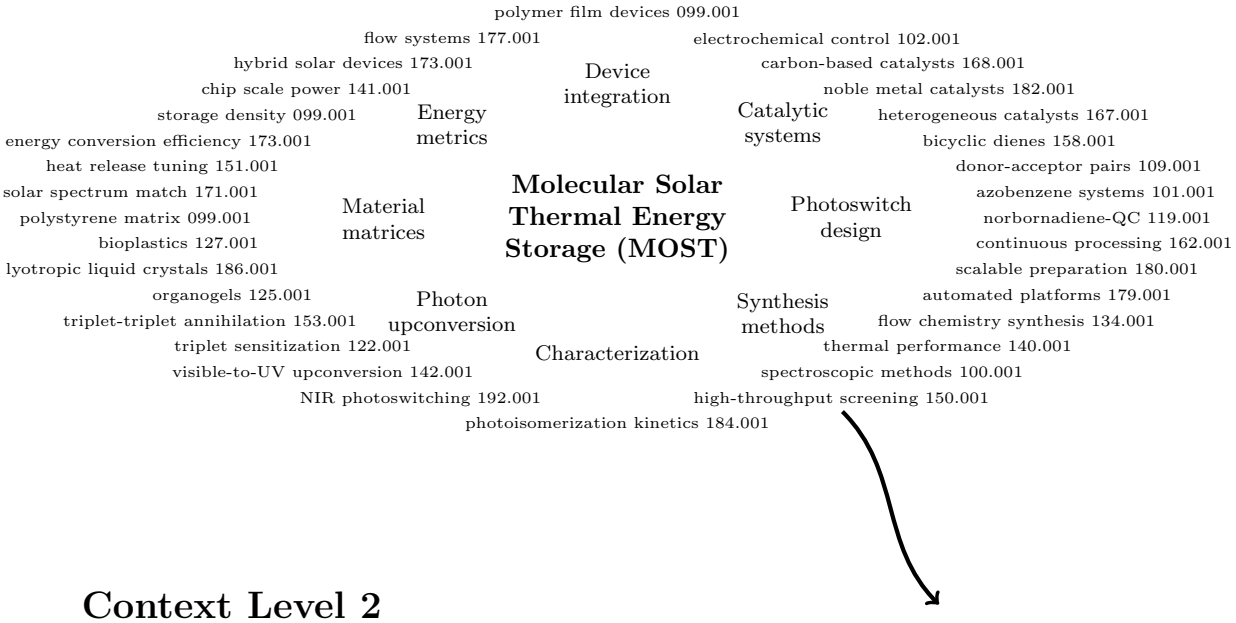
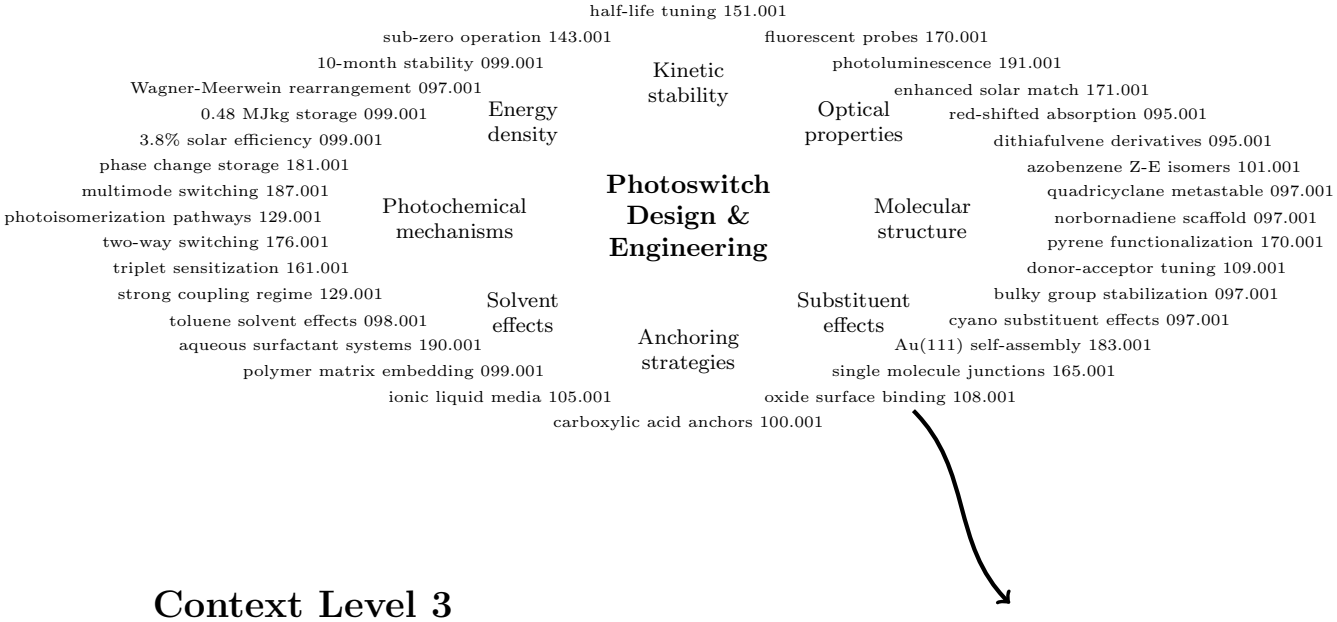
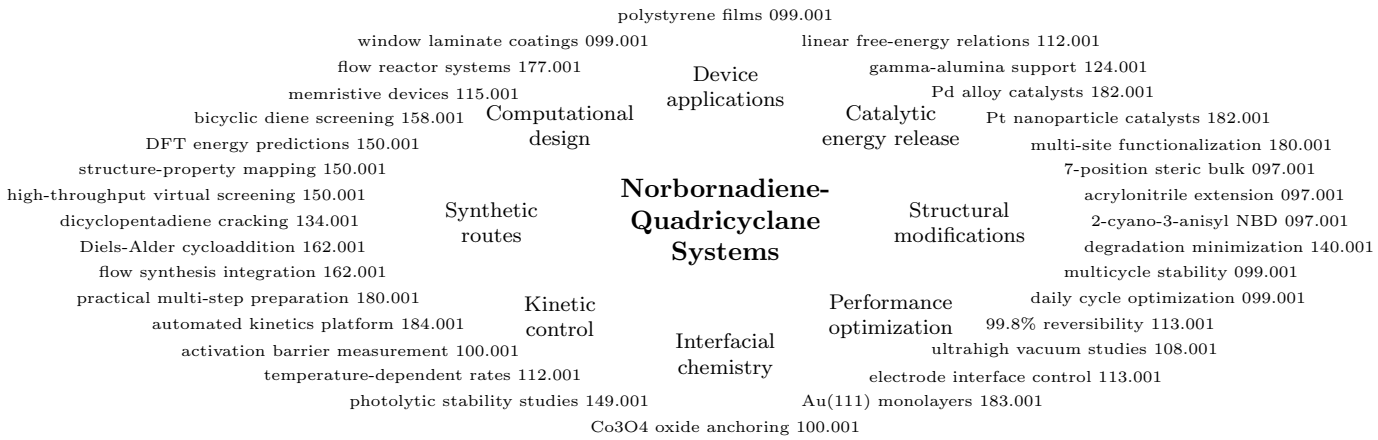
Context Level 1



Context Level 2



Context Level 3



Template for Adding Level 4

```
% Choose a concept from Level 3 (e.g., "Catalytic energy release")
\drawContextLevel{x-position}{y-position}{Catalytic\\Energy\\Release}{
    0/Catalyst\\types,
    1/Support\\materials,
    2/Reaction\\kinetics,
    3/Activation\\barriers,
    4/Temperature\\effects,
    5/Catalyst\\stability,
    6/Selectivity,
    7/Scale-up\\strategies
}{
    0/platinum nanoparticles 182.001,
    0.25/palladium alloys 182.001,
    0.5/carbon-based catalysts 168.001,
    0.75/oxide-supported metals 182.001,
    1/gamma-alumina 124.001,
    1.25/silica supports 130.001,
    1.5/electrode materials 113.001,
    1.75/surface functionalization 168.001,
    ... (add more outer detail labels with xxx.yyy tags)
}{1}
```

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.

Context Map Content: This map visualizes the Moth-Poulsen research group's work on Molecular Solar Thermal Energy Storage, progressing from the overarching MOST concept (Level 1) through photoswitch design and engineering (Level 2) to detailed norbornadiene-quadricyclane systems (Level 3). Each level contains 8 aspect categories with 32 specific implementations distributed across the outer radius.

Source Tagging: Each outer ring item includes a tag in the format `xxx.yyy` that references the source publication:

- **xxx**: Publication number from the Moth-Poulsen Publications list (193 most recent to 094 oldest, covering 2020–2025)
- **yyy**: Unique identifier within publication (001 = primary reference)
- Example: `119.001` refers to publication #119 "Engineering of Norbornadiene-Quadricyclane Photoswitches"
- Example: `099.001` refers to publication #99 "Solar Energy Storage by Molecular Norbornadiene-Quadricyclane Photoswitches: Polymer Film Devices"
- **Source Directory**: `docs/moth-poulsen.com:publications/Moth-Poulsen Publications (193-94)_summa`