

Visual Image Interpretation

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Levels of interpretation

- **Selective key:** Reference which contains numerous examples with supporting text.
 - **The interpreter selects one example image that mostly near by resembles the feature or condition found on the image under study.**
- **Elimination key:** is arranged so that the interpretation proceed step by step from the general to specific and leads to the elimination of all features or conditions except the one being identified.
- **Dichotomous keys:** where the interpreter makes a series choice between two alternatives and progressively elementals all but one possible answer

Elements of image interpretation

- Image analysis requires explicit recognition of eight ***elements of image interpretation*** that form the framework and understanding of an image

T²S³SAP

- ❖ Tone
- ❖ Texture
- ❖ Shape
- ❖ Size
- ❖ Shadow
- ❖ Site
- ❖ Association
- ❖ Pattern

Tone

- Refers to the average brightness of an area or, in the case of color imagery, to the dominant color of the region
- Refers to the colour or reflective brightness
- It is the measure of the relative amount of light reflect by an object and recorded by the photograph
- Tonality is influenced by the following factors
 - ✓ **Light reflectivity of the object**
 - ✓ **Angle of reflected light**
 - ✓ **Geographic latitude**
 - ✓ **Type of photography or film sensitivity**
 - ✓ **Photographic processor**
 - Depends on the nature of the surface in the angles of observation and illumination.
 - Smooth surfaces behave like ***specular reflectors***, they tend to reflect radiation in a single direction
 - These features may appear bright or dark
 - Rough surfaces behave this ***diffuse reflectors***.
 - Scatter radiation in all directions.
 - A peer is medium gray tones



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Texture

- Refers to the variation in tone over a surface or the apparent roughness of the surface as seen in the photo
- Created by micro shadows in small irregularities in the surface.



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Shape

- The outline of a feature
 - Important to note that shape depends on perspective
 - Overhead perspective, introduces scale effect



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Size

- The first to the dimensions of a feature
- **Relative size** determined by comparing the object with familiar nearby features
- **Absolute size** refers to the use of the aerial image to derive measurements



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Shadow

- Refers to large distinctive shadows that revealed the outline of a feature as projected onto a flat surface.
 - Depends on the nature of the object, angle of illumination, perspective, and slope of the ground surface



Site

- Refers to a future's position with respect to topography and drainage.
 - Some things occupy a distinctive topographic position because of their function
 - Sewage treatment facilities at the lowest feasible topographic position.
 - Power plants located adjacent to water for cooling



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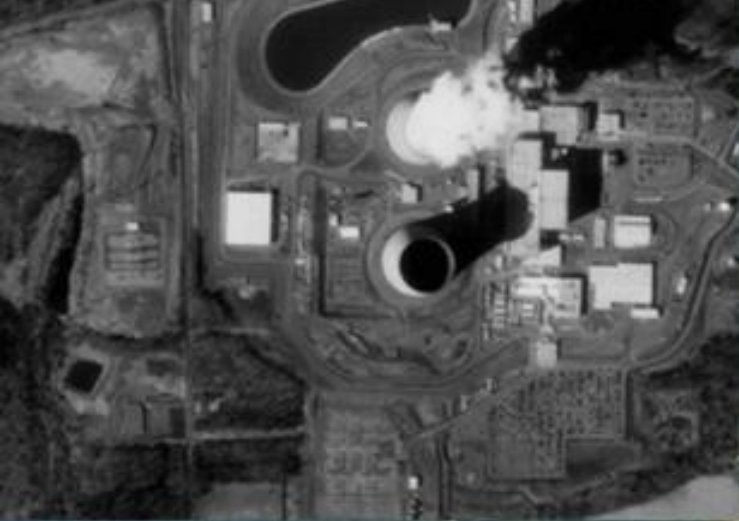
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Association

- Association refers to the distinctive spatial interrelationships between features
 - Schools often associated with athletic fields.
 - Large parking lots often associated with malls



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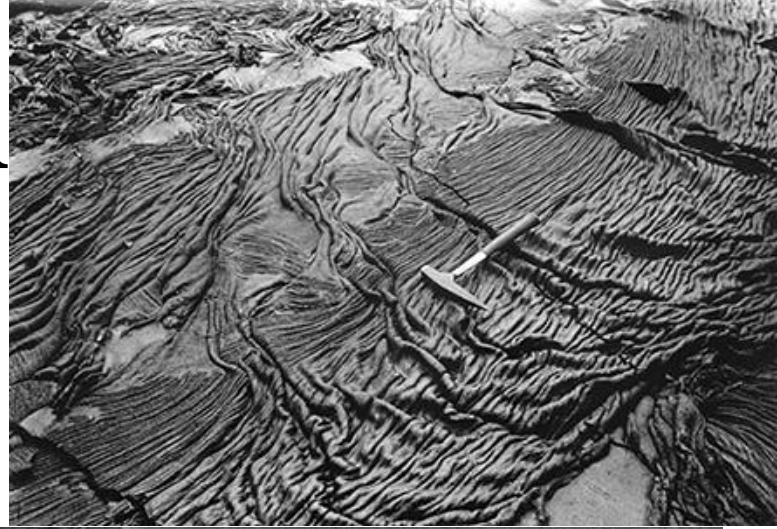
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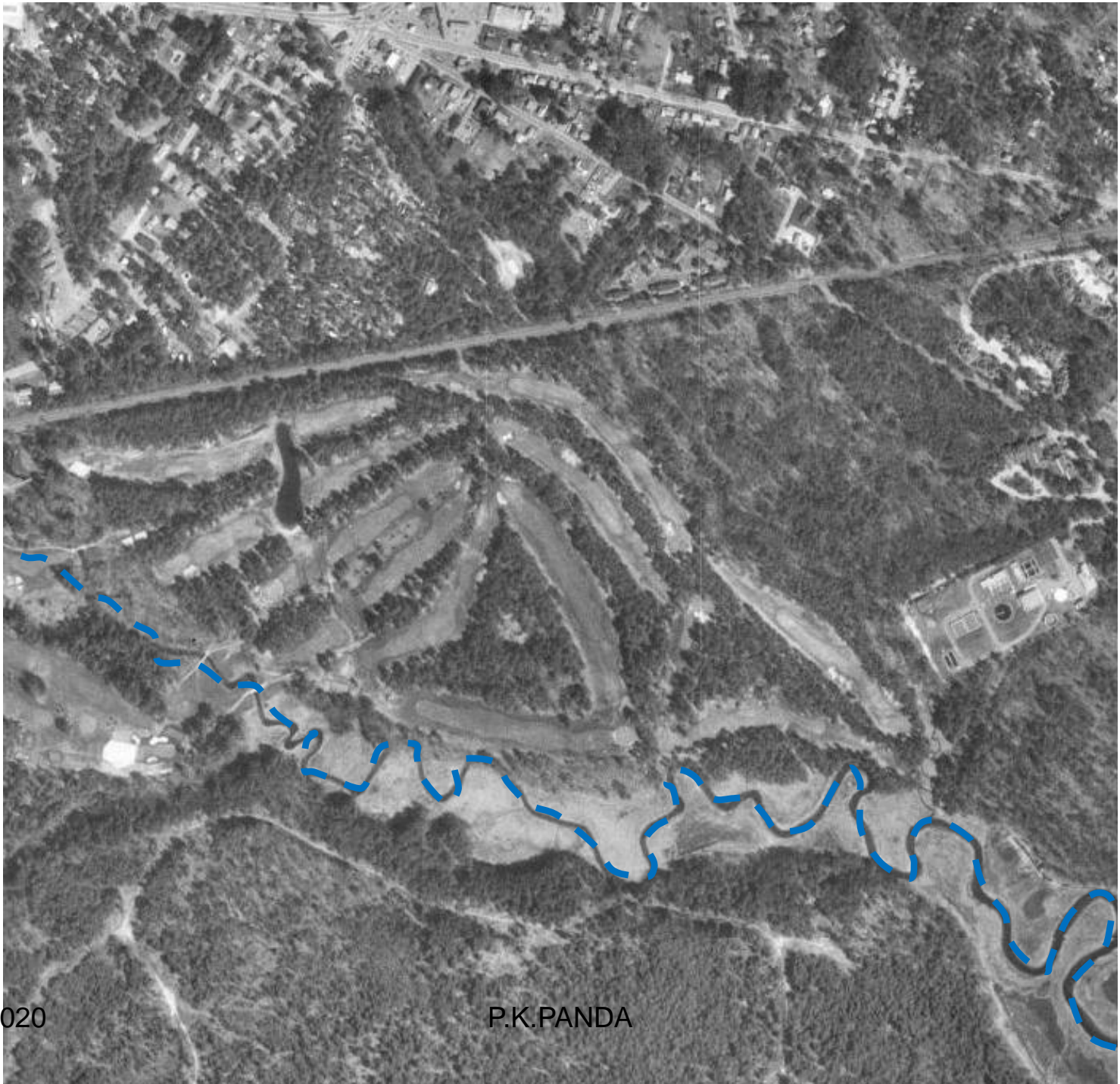
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Pattern

- Refers to distinctive arrangement of features
 - Mobile home parks have rectangular buildings arranged in rows





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PRIMARY ORDERING OF IMAGE ELEMENTS FUNDAMENTAL TO THE ANALYSIS PROCESS

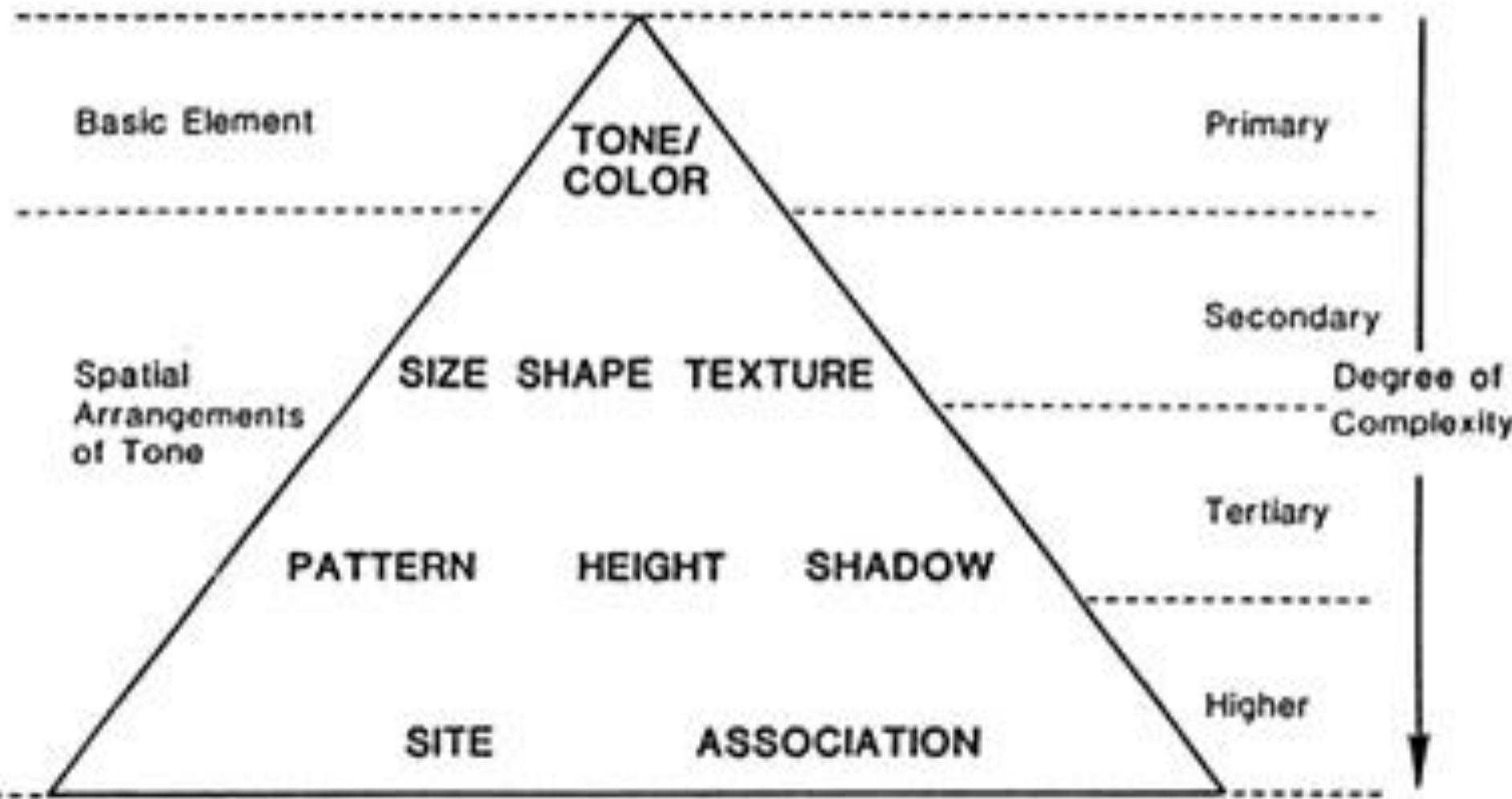


Image Analysis Tasks

Detection/Identification
Measurement
Problem Solving

Manual Procedures

Computer-Assisted Procedures

Analysis Procedures

- Hypothesis Testing
- Line of Reasoning
- Convergence of Evidence

Techniques and Aids

- Perceptual Models
- Collateral
 - Material
 - Literature
 - Lab Measurement
 - Interpretation Keys
 - Field Work
- Stereoviewing
- Search Methods

Elements

- Basic Elements
 - Tone / Color
- Higher Order Spatial Arrangements
 - Size > Geometric Arrangement of Tone / Color
 - Shape > Spatial Arrangements of Tone / Color
 - Texture > Spatial Arrangements of Tone / Color
 - Pattern > Spatial Arrangements of Tone / Color
 - Height > Interpretation Based on Lower Order Elements
 - Shadow > Interpretation Based on Lower Order Elements
- Site > Locational Elements
- Association > Locational Elements

Techniques and Aids

- Training Sites
- Collateral Material
 - Prior Probability
- Mathematical Models

Analysis Procedures

- Statistical Pattern Recognition
- Syntactical Pattern Recognition
- Decision Theoretical Approach
- Symbolic Reasoning