

# DISEÑO ASISTIDO POR ORDENADOR

## 4º Curso Ingeniería Informática

### Dpto. Lenguajes y Sistemas Informáticos

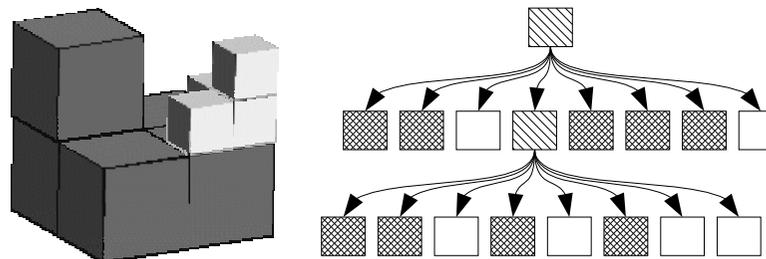
Curso 2004/05

## Tema 5: Modelado de sólidos (4ª Parte)

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### 5.4. Octrees

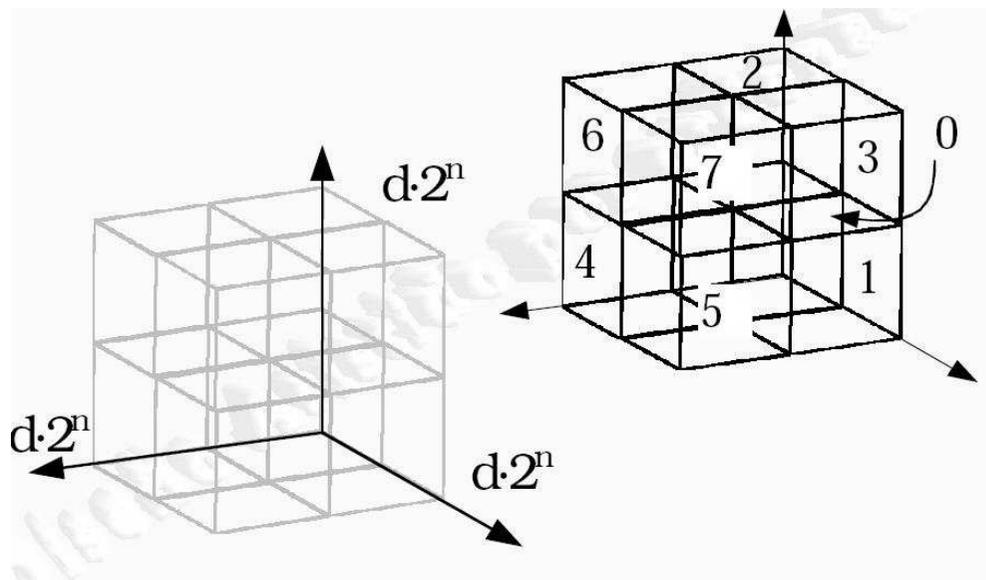
**Métodos de descomposición**  
 $S = \cup C_i$



B B W ( B B W B W B W W ) B B B W

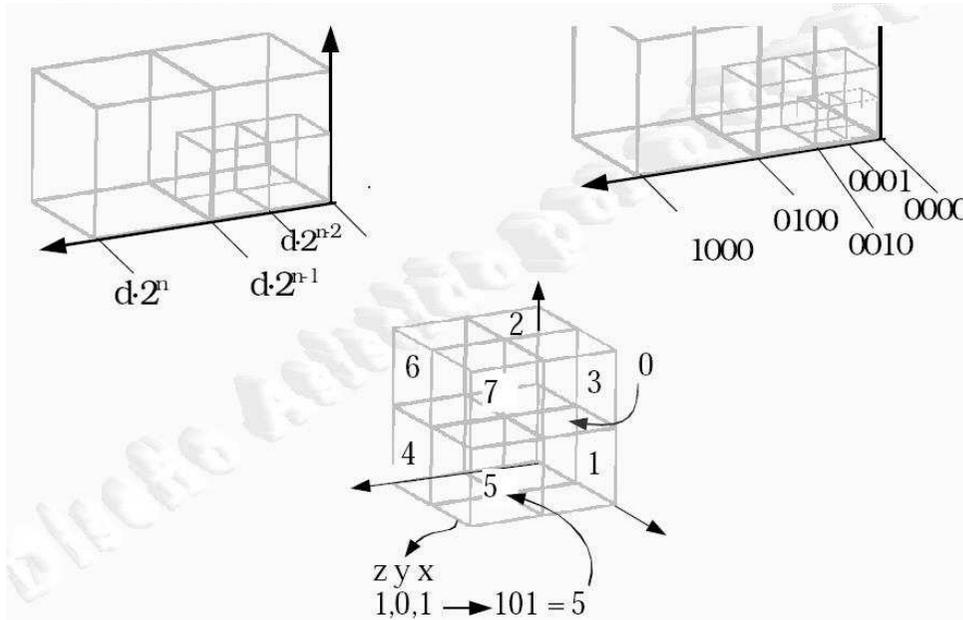
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### 5.4. Octrees



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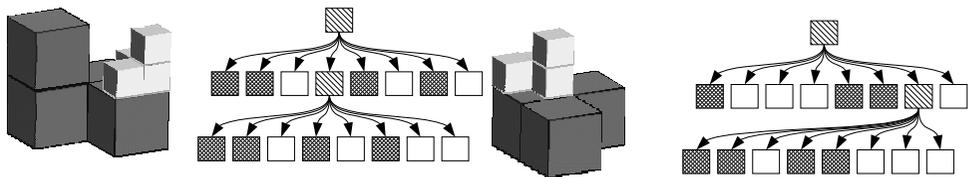
### 5.4. Octrees



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# 5.4. Octrees: Operaciones booleanas

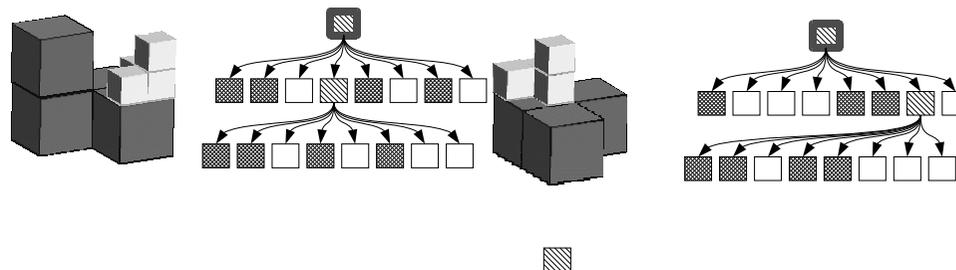
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A ∩ B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Copiar B	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Copiar A	Descender	



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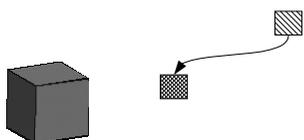
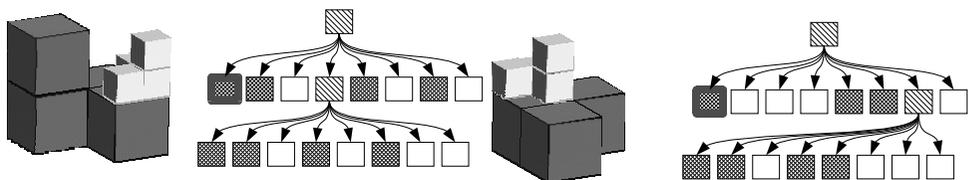
		B		
A ∩ B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Copiar B	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Copiar A	Descender	



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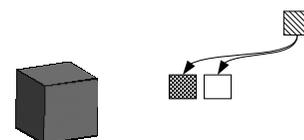
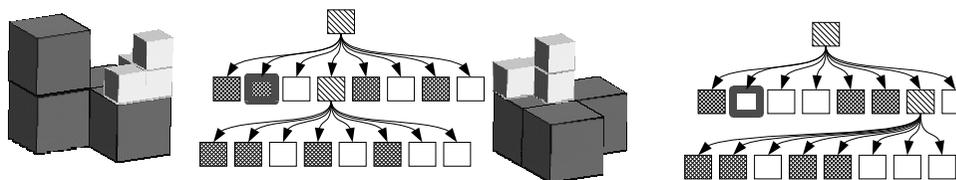
		B		
A ∩ B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Copiar B	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Copiar A	Descender	



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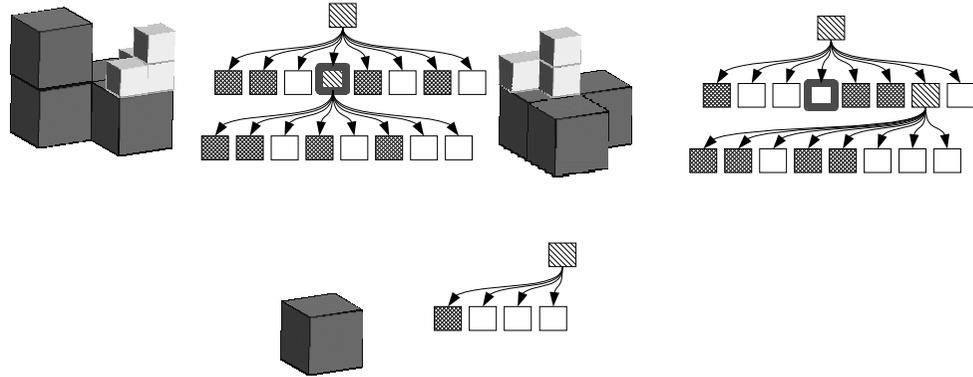
		B		
A ∩ B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Copiar B	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Copiar A	Descender	



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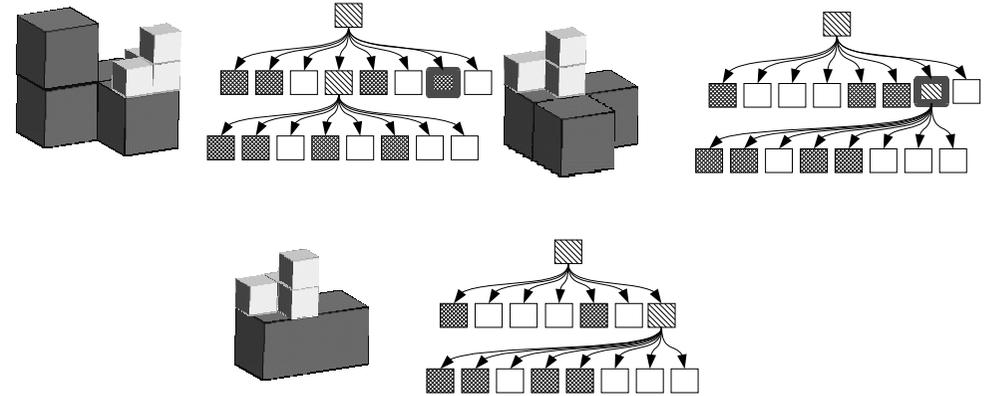
		B		
$A \cap B$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	<input checked="" type="checkbox"/>	Copiar A	Descender	



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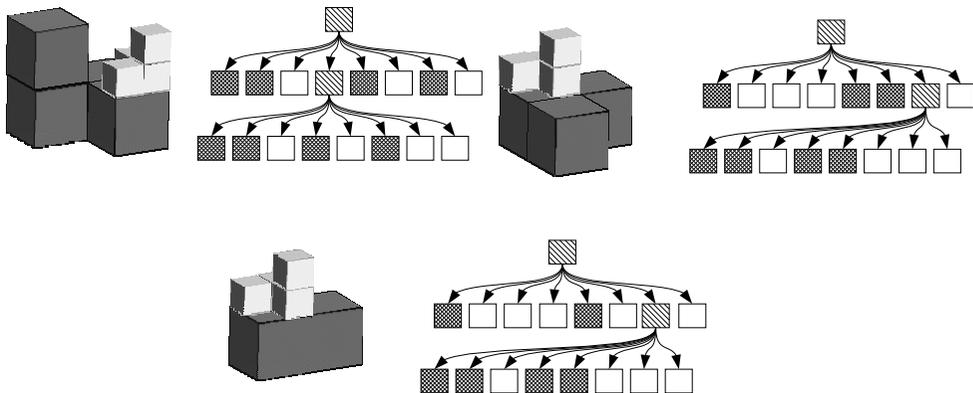
		B		
$A \cap B$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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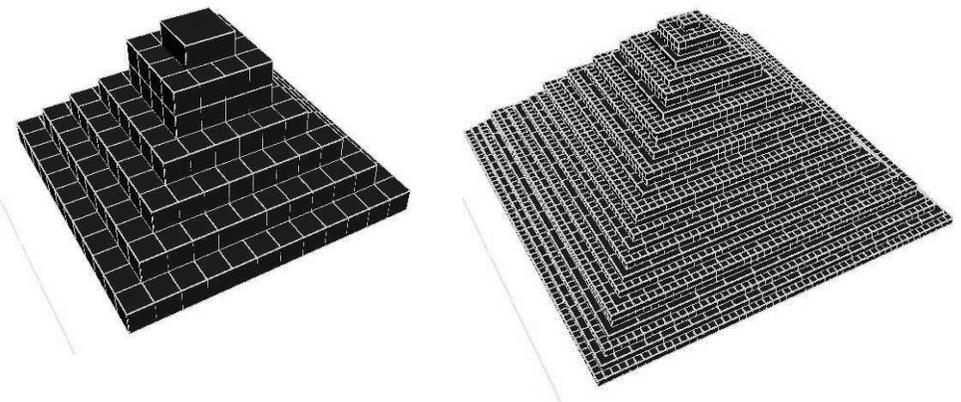
		B		
$A \cap B$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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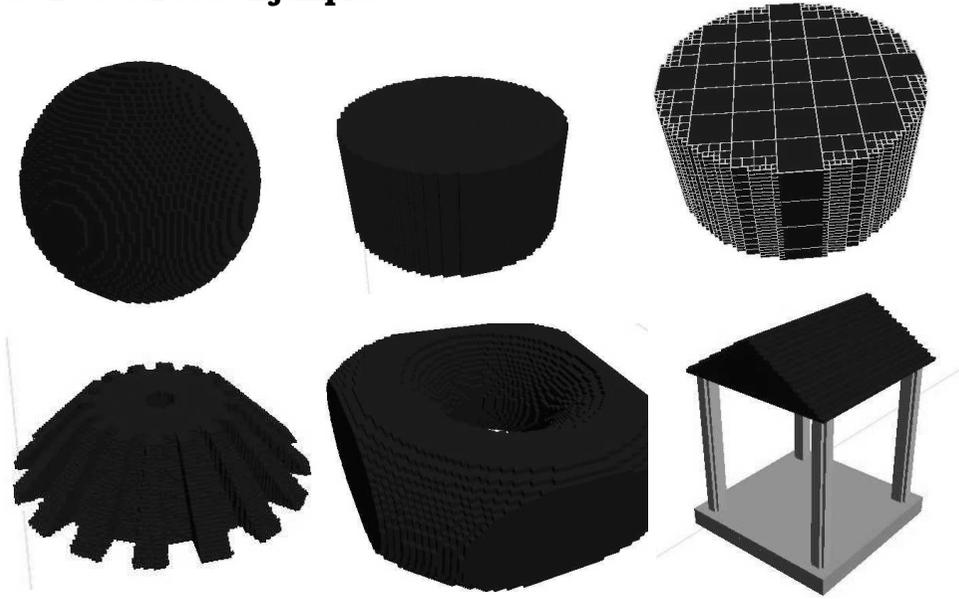
### 5.4. Octrees: Calculo de propiedades

$$Propiedad(Sólido) = \iiint_{Vol(Sólido)} G_p(x, y, z) dV = \sum_{\text{nodos llenos}} G_p(\text{voxel}) \cdot V(\text{voxel})$$



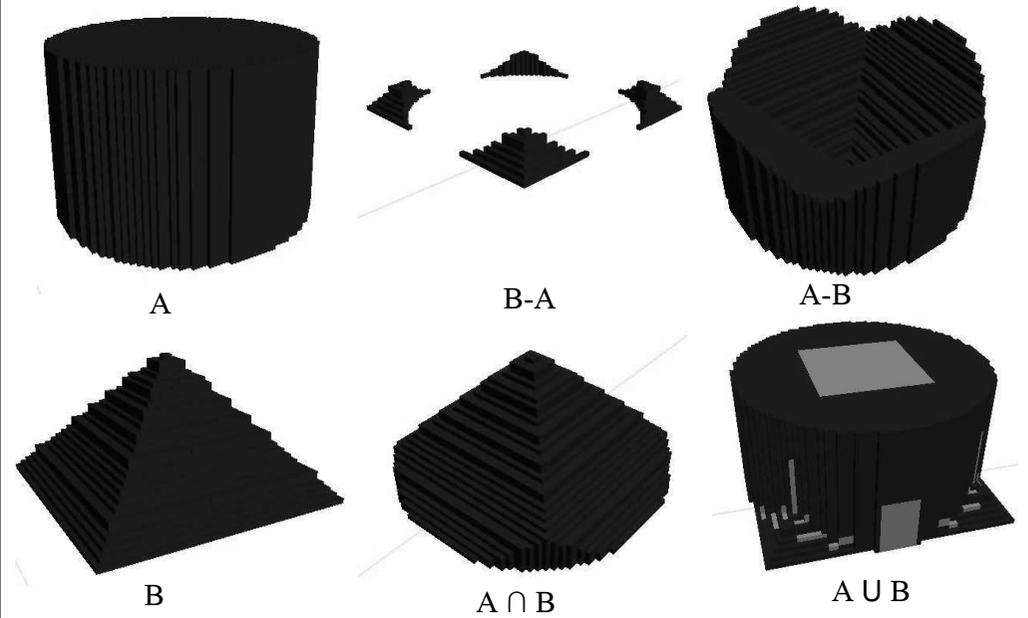
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## 5.4. Octrees: Ejemplos



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## 5.4. Octrees: Ejemplos de operaciones booleanas



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## 5.4. Octrees: Propiedades formales

**Dominio:** Cualquier sólido (aproximado)

**Validez:** Si

**Unicidad:** Si

**Ambiguo:** NO (salvo errores de representación por aproximación)

*J.C. Torres, P. Cano*