
Interleave Division Multiple Access (IDMA)

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Outline

- ▶ IDMA Intro
- ▶ IDMA Vs CDMA
- ▶ IDMA Structure
- ▶ Future Work



Outline

▶ **IDMA Intro**



- What is IDMA?
- Advantage of IDMA.

▶ IDMA Vs CDMA

▶ IDMA Structure

▶ Future Work



Outline

▶ IDMA Intro



- What is IDMA?
- Advantage of IDMA.

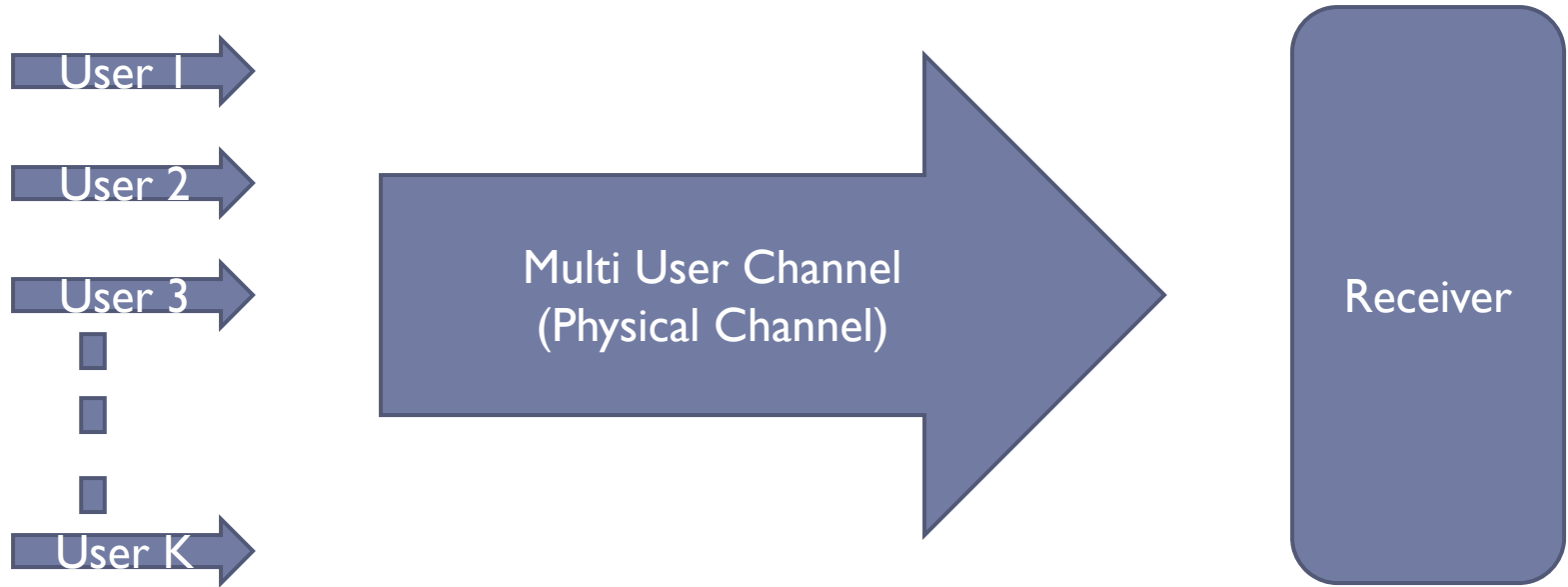
▶ IDMA Vs CDMA

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What is IDMA?



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▶ IDMA Intro



- What is IDMA?
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Advantage of IDMA

- ▶ Interference elimination.
- ▶ Increased diversity against fading.
- ▶ Very low receiver cost.
- ▶ De- centralized control (Asynchronous).
- ▶ Optimal Capacity.



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▶ **IDMA Vs CDMA**



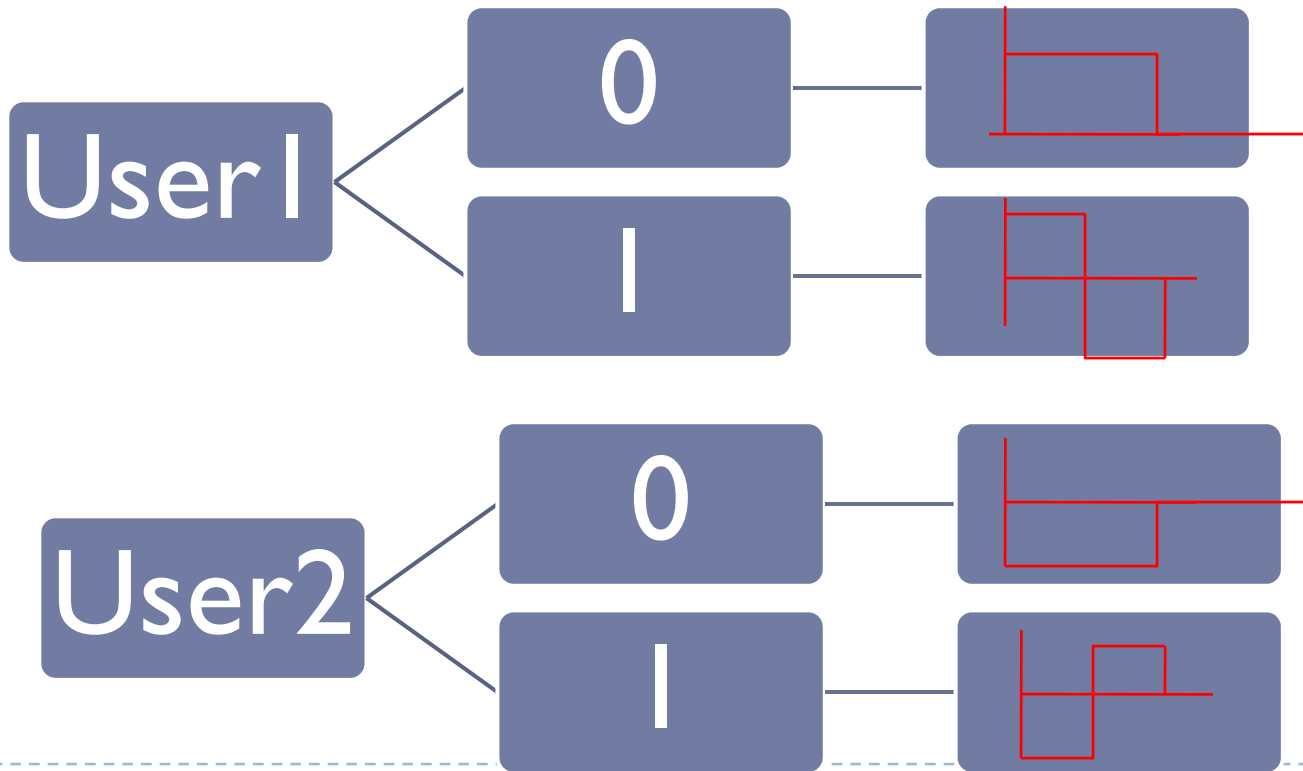
- CDMA Sending Mechanism.
- IDMA Sending Mechanism.
- Interleavers.

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CDMA Sending Mechanism



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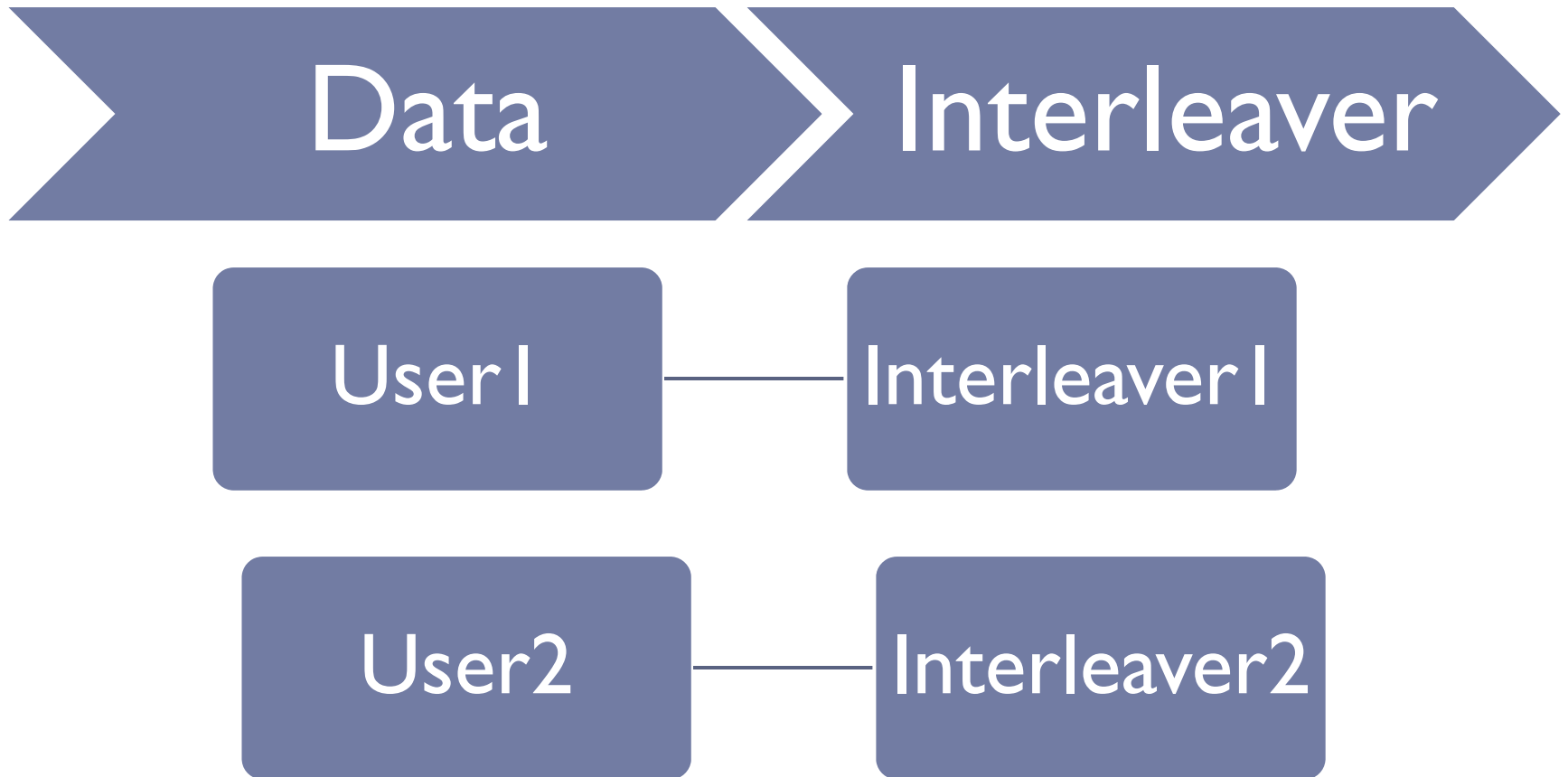
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IDMA Sending Mechanism



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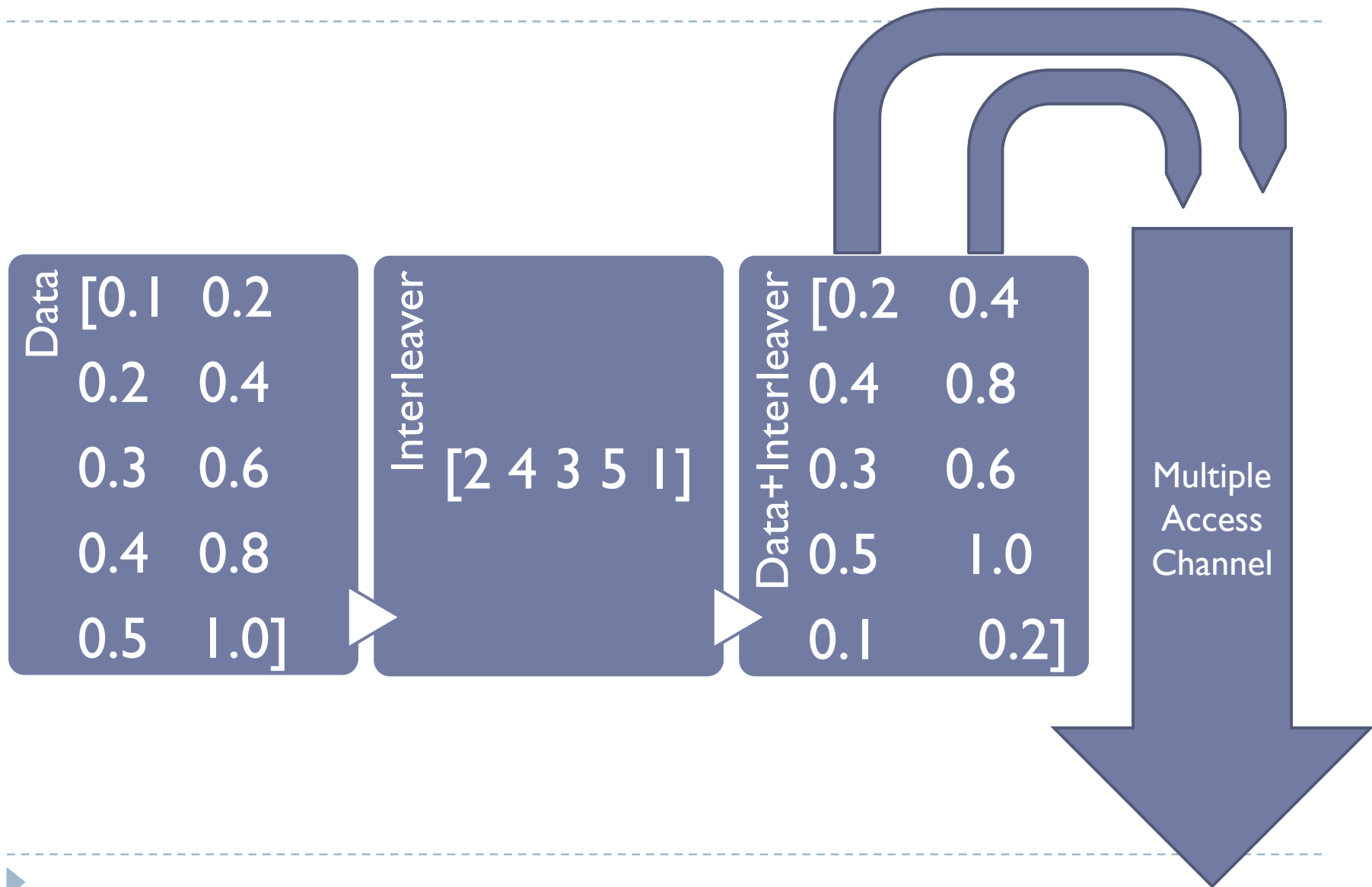
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Interleavers



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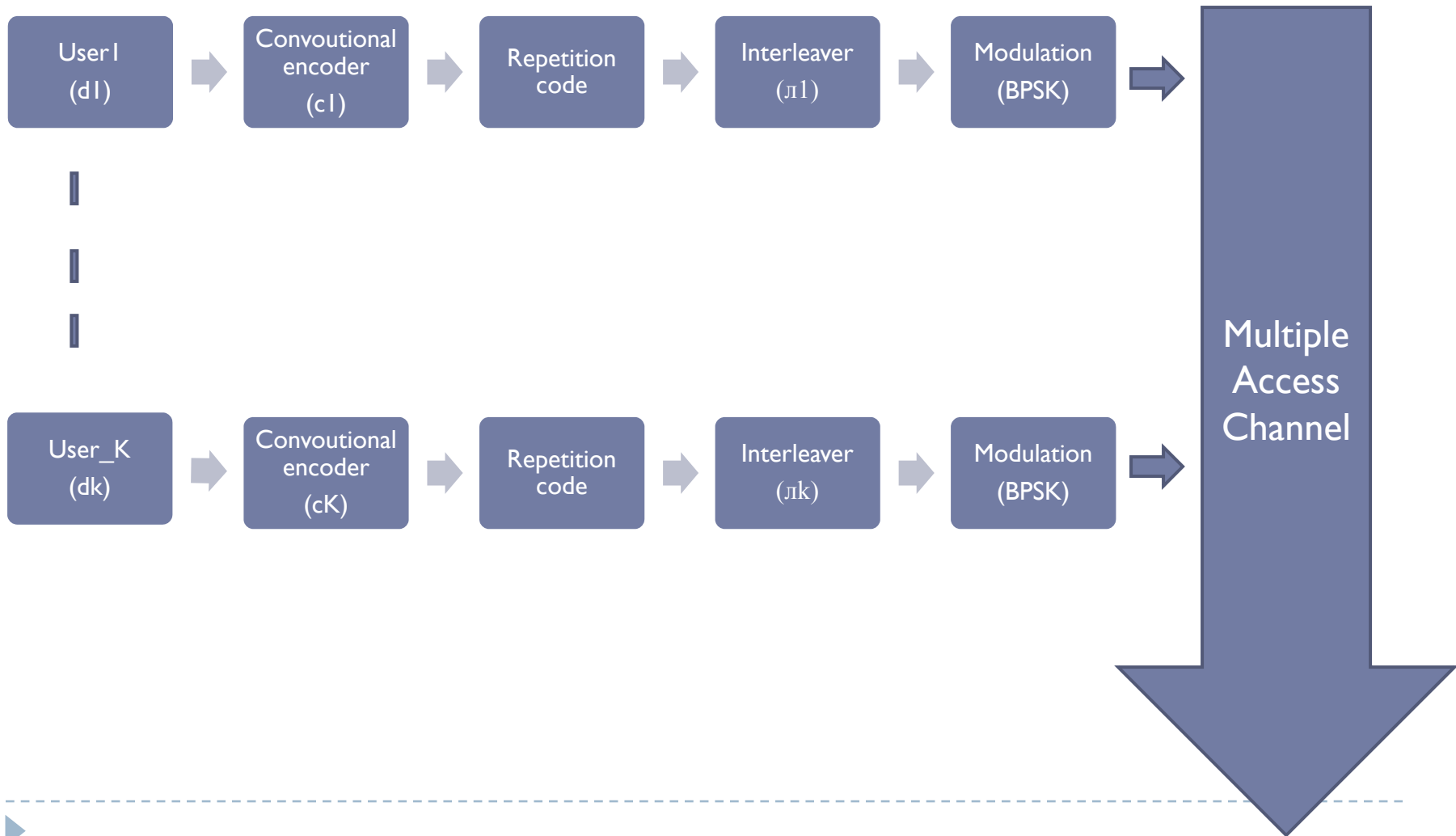
▪ Transmitter Structure.

▪ Receiver Structure.

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Transmitter



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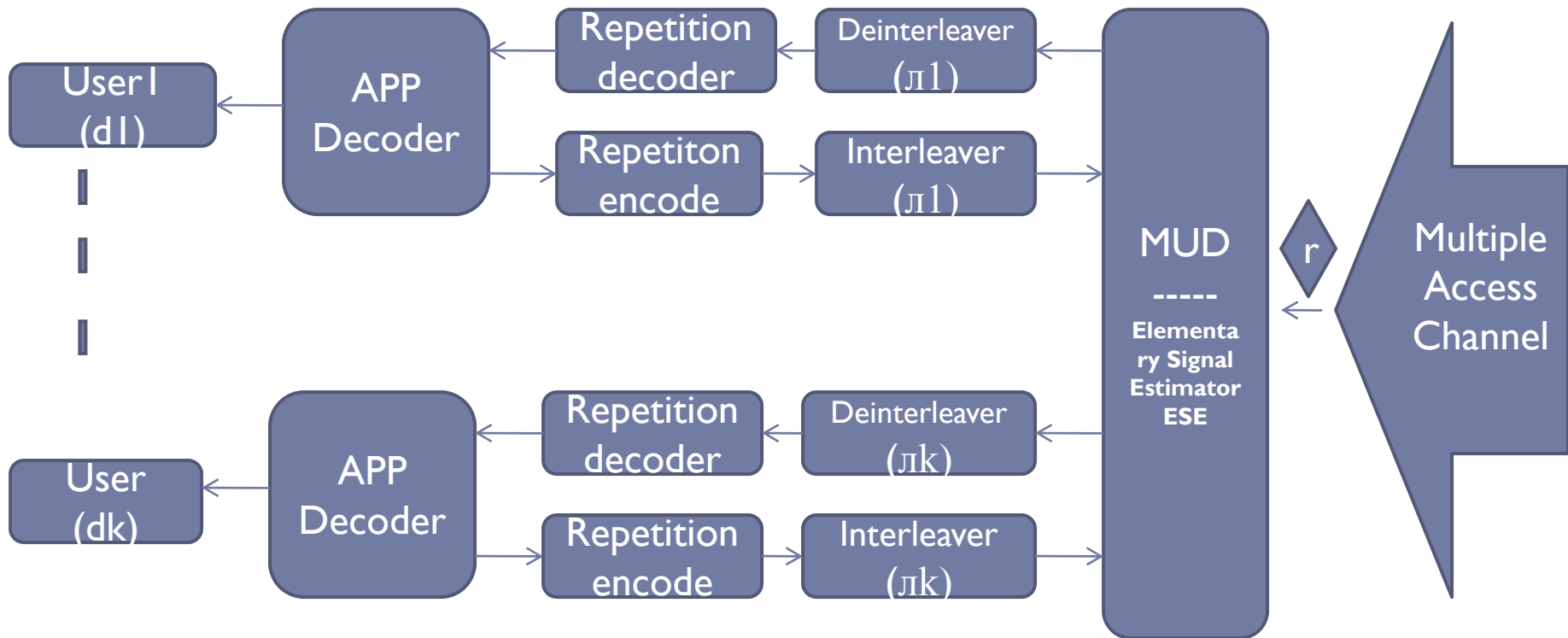
▪ Transmitter Structure.

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Receiver



Received Signal

▶
$$R(j) = \sum_{k=1}^K h_k x_k(j) + n(j) \quad j=1,2,\dots,J \quad \text{Where:}$$

h_k : The fading coefficient related to user k .

$n(j)$: The additive white gaussian noise with zero mean and variance = $\sigma^2 = N_0/2$.



Elementary Signal Estimator(ESE)

- ▶ The output of ESE and DEC are extrinsic log-likelihood ratios (LLRs) about $x_k(j)$ defined as:

$$e(x_k(j)) = \log \left(\frac{P(X(j) = +1)}{P(X(j) = -1)} \right)$$



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Future Work

- ▶ Complexity of the receiver.
- ▶ Generating of interleavers.



Conclusion

- ▶ IDMA is a strong candidate to replace CDMA.



Question!

