Dasher
A Data Entry Interface Using Continuous Gestures and Language Models

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What does compression have to do with user interfaces?

Typical text compression scenario

User interface scenario
Gallery of Input Modalities
Quick review of arithmetic coding

- An interval on the real line corresponds to each continuation.
- Length of this interval reflects likelihood as predicted by a model.
- Each interval is subdivided recursively.
- Compressed size equals entropy of the model.
How the Dasher interface works

- Just point where you want to go.

- The point in the coding plane that the cursor is pointing at will pass through the crosshairs (center of the display) in S frames.

- Parameter S controls speed/responsiveness of the interface.
• The visible region of the coding plane corresponds to an interval on the real line.
Further refinements:

- Nonlinear mapping of x axis makes it easier to backtrack (delete).
• Nonlinear mapping of y axis makes it easier to make course corrections.
The predictive model

- Dasher uses PPM to predict future text.
- The maximum order context used is 5.
- Some extra probability is added to each character in the alphabet.
- The entropy is about 1.7 bits per character.
Testing the efficiency of Dasher
Learning rate
Conclusions

• Continuous gestures make it easier to enter text without errors. (Subjects made fewer errors with Dasher than with the keyboard.)

• With practice, Dasher should be competitive with other alternative text-entry modalities.

• However, it requires sustained visual attention, making it unsuitable for many applications.

• May be very useful for users who are unable to use a keyboard (works with eye-tracking).