



# Canning Spam

Email users ask the same question as surprised diners: Who ordered the spam? The answer is no one, but sending back email spam only brings more. People are fighting spam with many new tools, including filters that look for telltale signs that a message is spam. Spammers, however, defeat simple filters by disguising the words and intent of their messages. New, more sophisticated filters use mathematics to fight spam by training the filters to recognize spam over time, so that your server brings you what you want.

Spammers adapt their messages to avoid many anti-spam tools, but using a mathematical result known as Bayes' Theorem, the tools can adapt as well. As users examine email each day, they indicate which messages passing through the filter are, in fact, spam. With training, the filter learns how likely it is that certain words or characteristics are present when a message is spam. Bayes' Theorem allows the filter to turn this information around, calculating how likely it is that the message is spam when those words or characteristics are present. It is a powerful application of an old and fundamental mathematical result. Using new and old mathematical tools, mathematicians continue to work on innovative techniques to combat spam.

**For More Information:** "Math 1, Spam 0," Dana Mackenzie, *SIAM News*, November, 2003.

The screenshot shows an email client interface with a navigation bar at the top containing 'Mail Home', 'Inbox', 'Write', and 'Address Book'. Below the navigation bar, the 'Inbox' section is displayed with '5 Unread Message(s)'. Action buttons include 'Delete', 'Report Junk', and 'Move checked item(s) to...'. A table lists five spam messages, each with a checked checkbox, an envelope icon, and a red 'X' icon.

<input type="checkbox"/>	<input checked="" type="checkbox"/>	From	Subject	↓ Date
<input type="checkbox"/>	<input checked="" type="checkbox"/>	katiemay@cabledeals.edu	Never pay for cable again	06/21/04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Robert@gygacre.com	Turn your opinion into biggg bux	06/21/04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	coolpix@insthematic.com	dwghdxqL@@K	06/21/04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	theremedy@chemcross.net	Miracle Hangover Cure	06/21/04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	contest@eaulfactory.com	Free Rolex just for you!!	06/21/04



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