Project Proposal: `ggillustrate` – An R Package for AI-Enhanced Chart Illustration

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High-Level Goal

To develop an R package that transforms data visualizations into stylized illustrations using sketch-to-image AI models.

Project Description and Motivation

Traditional data visualizations (e.g., bar charts, line plots) are functional but often lack the aesthetic appeal and storytelling potential needed in journalism, content marketing, or education. This project aims to bridge that gap by integrating generative AI models with R's visualization ecosystem, allowing users to convert ggplot2 charts into creative, themed illustrations.

The core idea is to convert a ggplot chart into a sketch using edge detection, then send the sketch along with a user-defined prompt to a sketch-to-image AI model (e.g., ControlNet via Replicate API). The result is an image that retains the chart's structure but expresses it using metaphors (e.g., coins, mountains, rockets), enhancing communication and emotional engagement.

This project is interesting because it blends statistical graphics, image processing, and state-of-the-art generative models. It offers a novel way to present information visually, especially useful for educators, infographic designers, and storytellers. It also serves as a lightweight proof-of-concept for how AI and data viz can co-evolve in software tools.

Weekly Plan and Team Member Tasks

- **Week 1** (All): Finalize project scope, set up R package scaffold using `usethis`, and prepare demo ggplot-based charts.
- **Week 2** (An + Hiep): Write edge-detection + sketch conversion logic in Python (OpenCV), integrate into R using `reticulate`.
- **Week 3** (Hieu + Hiep): Add Replicate API call logic to Python backend; build the

`illustrate_plot()` wrapper function in R.

- **Week 4** (Hieu + An): Build documentation site with `pkgdown`, add vignettes, and test different prompts + models.
- **Week 5** (All): Polish visuals, write usage guide, prepare poster/demo, and finalize submission.

GitHub Repository

All code, documentation, and assets will be maintained at:

`https://github.com/ancan203/ggillustrate`