

# 2006

## IEEE-USA UNEMPLOYMENT SURVEY RESULTS

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Edited by Georgia C. Stelluto, IEEE-USA Publishing Manager

Cover design and layout by Gregory O. Hill, IEEE-USA Electronic Communications Manager

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## Table of Contents

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<b>Summary of Results</b> .....	4
Survey Responses .....	4
Age and the Survey Responses .....	7
Multivariate Analysis of Age and the Survey Responses .....	9
Selected Comparisons of the 2006 Responses to 1995, 1996, 1998, 2002 and 2004 Survey Responses .....	10
Employment Outcomes, Job Search Techniques, Industry, Re-employment Services, and Education: Some Additional Contingency Table Results .....	12
<b>Frequency Analysis</b> .....	14

## 2006 IEEE-USA Unemployment Survey Results

The IEEE-USA Employment and Career Services Committee has continued its interest in developing a better understanding of the problem of unemployment among electrotechnical professionals by conducting a survey of unemployed members. The first survey was conducted in 1995 with replications in 1996, 1998, 2002 and 2004. The Committee replicated these surveys again by mailing virtually the same survey instruments used in 1995, 1996, 1998, 2002 and 2004 to 1723 U.S. IEEE members who reported being unemployed at some time during the 2005-6 membership year and who consequently paid dues at a reduced rate. This is a smaller number of invitations than in the past, because the list was collected earlier, shortly after the renewal period ended. The purpose was to get proportionately more responses from respondents who had been re-employed. This year, 331 surveys were returned, representing a 19 percent response rate. This is the same response rate as that in 2004. The 19 percent response rates are slightly below the 26 percent-28 percent response rates garnered in 1995, 1998 and 2002, but they are slightly better than the 14 percent response rate in 1996.

This report of results is organized in four sections. The first section reports the percentage distribution or mean response for each of the questions in the survey. The second reports the results of selected cross tabulations that focus on age and various aspects of employment status. The third reports the results of a multivariate analysis that focuses on the impact of age on the duration of unemployment when other factors are held constant. The final section compares some of the current results to those in 1995, 1996, 1998, 2002 and 2004.

### Survey Responses

Respondents were asked to describe their current employment status. The modal respondent (47 percent) responded that he/she was involuntarily unemployed. About 17 percent had been reemployed full-time as a technical professional. (This compares to 26 percent who reported full-time re-employment as a technical professional in 2004.) The rest were employed in a non-technical profession (2 percent), employed part-time (4 percent), or self-employed (6 percent). Some 7 percent reported voluntary unemployment, 6 percent said they were retired voluntarily, and 6 percent said they were retired involuntarily.

Respondents were next asked their industry of employment. A total of 22 percent of respondents worked in the computer industry (hardware or software), 18 percent were in electrical/engineering services or manufacturing, and 12 percent were employed in the communications industry. Thirteen percent (13 percent) of respondents worked in the aerospace or defense industry (7 percent and 6 percent, respectively). Among the other listed fields (automotive, consulting, education, medical, petrochemicals, transportation, and utilities), no single field garnered more than 6 percent of respondents. However, some 15 percent could not list their field from the selections they were given. The mean number of engineers in respondents' firms was 751, but the distribution is skewed, since the median response is 50 engineers. The size of firms ranged from 0 to 20,000 engineers.

The modal respondent is not dependent on government contracts. The responses indicate that 52 percent of jobs are not dependent on government at all, and 28 percent were very little or somewhat dependent on government funding. Twenty percent (20 percent) were primarily or totally

dependent on government appropriations, compared to 15 percent in 2004.

Sixty-seven percent (67 percent) of respondents reported that they had been laid off from their last position. Those who were laid off were asked what reason the company gave for the layoff. The most common response was a business downturn (50 percent selected this response, compared to 62 percent in 2004). Sixteen percent (16 percent) reported that their jobs were transferred offshore (compared to 15 percent in 2004), while 8 percent reported that they were laid off because of merger or acquisition. Eleven percent (11 percent) reported being laid off because of efficiency improvements, and 10 percent because their work was transferred to another domestic location. In 2004, about 7-8 percent reported their work was transferred to another domestic location, or that they were laid off because of an efficiency improvement, respectively. Only 2 percent reported being laid off because of obsolescence. Some 24 percent reported being laid off for reasons not specified in the survey. Forty percent (40 percent) reported that the layoffs were across-the-board, while 60 percent reported that they were targeted at specific functions or units. (The comparable numbers in 2004 were 46 percent and 54 percent, respectively.)

All respondents were asked whether they wanted to remain in their primary area of technical competence, and 71 percent did, compared to 80 percent in 2004. Twenty-nine percent (29 percent) wanted to move out of their primary area of technical competency.

Most respondents (61 percent) do not contemplate more schooling, but 27 percent consider returning to school part-time, and 12 percent consider returning full-time. Thirty-five percent (35 percent) consider leaving engineering entirely. These responses are similar to those in 2004.

The duration of unemployment varies widely among the respondents, from a low of 1 week to a high of 500 weeks (or about 10 years). (The range was the same in 2004.) The mean is 99 weeks while the median is somewhat less, at 62 weeks, reflecting a skewed distribution in which a few respondents report exceedingly long spells of unemployment (e.g., over 300 weeks). Some of these respondents may not be actively looking for work. (In 2004, the mean duration of unemployment was 82 weeks, and the median was 68.)

Respondents were asked what services their employer provided when they left. Respondents could check more than one service, and many did. Severance was provided in 51 percent of the cases and extended benefits in only 30 percent of the cases. Outplacement help was provided to 28 percent of respondents and retraining was offered to only 6 percent of respondents. Thirty nine percent (39 percent) report that their employer provided none of the benefits listed in the survey. (The 2004 responses were similar.)

Respondents were asked to describe their employment search and the results. Over half (57 percent) agreed that it was very difficult to find a new job, compared to 66 percent in 2004; only 4 percent said that it was fairly easy to find a new job. Less than 10 percent each reported that an offer fell into their lap (5 percent), that they found a great job (6 percent), or even an adequate job (7 percent), or that they anticipated a raise (3 percent). About one-fifth (19 percent) anticipates a pay cut. Forty-three percent (43 percent) reported they have not yet found a job, compared to 36 percent in 2004.

Slightly more than one third (37 percent) would recommend engineering to their son or daughter, compared to 27 percent in 2004; 35 percent would not, compared to 41 percent in 2004; and 28 percent are not sure, compared to 32 percent in 2004.

Slightly fewer than half (48 percent) report that they are aware of IEEE-USA's employment assistance services. In 2004, slightly more than half (52 percent) reported awareness of IEEE-USA's employment assistance services.

Respondents were asked to rank on a 9-point scale the job search techniques that worked best for them. Comparing the job search techniques in terms of whether the response was ranked in the top three, forty-five percent (45 percent) of respondents rated networking as especially helpful; 19 percent found Internet job listings beneficial; 16 percent found headhunters in the top three, 16 percent found that sending out resumes was useful, and 16 percent rated private consultants in the top three. Some 14 percent said that ads were helpful; 11 percent rated going to job fairs, and 9 percent rated outplacement services in the top three.

Respondents were asked what they saw as major personal barriers to their employment or re-employment. Age was the most common response: 72 percent of respondents listed this as a barrier, compared to 67 percent in 2004. Some 28 percent selected national economic conditions, compared to 60 percent of respondents who listed this as a barrier in 2004. Area of technical competence was selected by 32 percent and geographic preferences was listed by 35 percent of respondents; and 8 percent cited a decrease in government spending as a personal barrier. Ethnicity was noted by 18 percent of respondents. Education was cited by 10 percent of the respondents, sex was listed by 9 percent of the respondents, and disability was listed by 7 percent of respondents. Eighteen percent cited other reasons not listed in the survey.

Respondents were asked their view of the long-term demand for engineers. Some 13 percent see the future as excellent, compared to only 5 percent in 2004. Eighteen percent saw it as poor compared to 24 percent in 2004. Between these categories, 36 percent saw the outlook as good and about the same proportion (33 percent) saw the outlook as fair.

As a follow-up to this question, respondents were asked the following open-ended question: what should IEEE be doing to help (if anything)? Some 37 percent provided a response, compared to almost half who answered this question in 2004. A few provided more than one response; the number of comments was 136, compared to 123 respondents. With a few exceptions, noted below, the responses were coded into the same general categories that were used in the previous (1995, 1998, 2002 and 2004) surveys. The denominator for the following percentages is the number of comments, not the number of respondents. The largest percentages of responses fell into one of two categories. One group (24 percent) urged IEEE to provide networking help, augment its job banks, provide more specialized information about jobs, etc. The largest group (31 percent) urged IEEE to do something to protect the supply of domestic engineers. Of these, most wanted IEEE to take steps to get Congress to reduce H1B visas and stop outsourcing of U.S. jobs; some wanted IEEE to unionize members and to restrict entry by licensing or certifying engineers. (This compares to 37 percent of respondents in 2004.) Seven percent (7 percent) of the respondents felt there was little that IEEE could do or they had no idea what IEEE could do about the future of engineering. Some 8 percent urged IEEE to improve the image of IEEE itself, of the profession, or to do other things to increase the demand for engineers. About 6 percent respondents urged IEEE to provide more technical training or technical information to members, or education and retraining. A new group (7 percent) urged IEEE to provide health and other insurance services, and another new group urged IEEE to reduce or eliminate fees and dues, especially for unemployed members. Seven percent (7 percent) urged IEEE to fight age discrimination, and 5 percent complimented IEEE or urged IEEE to keep up the good work.

Respondents were asked a series of questions about their personal characteristics and circumstances. Specifically, they were asked about their age, their years of professional and managerial experience, and about their education. They were also asked about the nature of the e-mail access they had via the Internet.

The mean respondent is 52 years old, and the median respondent is 53; the youngest is 2 and the oldest is 76. The mean years of experience among the respondents is 24, and the median is 25. The range is from 0 years of experience to 50 years.

The modal respondent has a BS in electrical engineering or other BS (76 percent). About 47 percent have an MS, MSEE or other Masters' degree and 11 percent have a PhD.

Virtually all (99.6 percent) respondents report having some access to the Internet. For those with access, multiple responses were possible, so percentages will add to more than 100. Among these recently or currently unemployed engineers, most have access at home (91 percent); 28 percent have access at work. Two-thirds (66 percent) have full access and 2 percent have email access alone.

Of the 331 respondents, 56 percent indicated that they would like IEEE to send them its packet of information for unemployed members.

## Age and the Survey Responses

A key concern of the previous surveys of unemployed engineers in 1995, 1998, 2002 and 2004 is the link between age and employment opportunities. It appeared in previous years that older engineers have significantly fewer re-employment opportunities than younger engineers. Similar patterns appear in 2006. The cross-tabulation results are below.

Consider the relation between age and employment status. The mean age of respondents who were re-employed full-time as a technical professional at the time they responded to the survey was among the youngest of the respondents (age = 45). The next youngest group (also age 45) was voluntarily unemployed. The largest subgroup was involuntarily unemployed (N=127); the mean age of this group is 53. A small group of respondents is self-employed (less than 10 percent); their mean age is also 53. A few respondents are employed as other than a technical professional, or are employed part time; their mean age is 56. The mean age of voluntary retirees is 61, and the mean age of involuntary retirees is 60. These differences are significant overall at less than the .0001 level.

There is also a significant relation between employment status and weeks of unemployment. The average number of weeks unemployed was 54 weeks for those re-employed full-time as an engineer. (The comparable number in 2004 was 51 weeks.) Compared to the other groups, this was the shortest duration of unemployment. Those employed part time report an average of 60 weeks of unemployment (69 weeks in 2004); and the self-employed have a mean of 69 weeks of unemployment (64 in 2004). Those re-employed in non-engineering jobs report a mean of 73 weeks of unemployment (61 in 2004). Among the unemployed, those who are voluntarily unemployed have an average of 146 weeks unemployment (130 in 2004), while the involuntarily unemployed have an average of 115 weeks of unemployment (96 in 2004). Involuntary retirees report an average of 96 weeks of unemployment (110 in 2004), while voluntary retirees report an average of 136 weeks (194 weeks in 2004). These differences are significant overall at less than the .0001 level.

Unlike 2004, there is no significant age difference between industries in which respondents were

(or are) employed. The oldest engineers worked in the utilities and transportation industry (mean of 56 and 54 years, respectively), and the youngest worked in electrical/electronic services and education (mean of 44 and 46 years, respectively). The overall age difference between industry groups is not significant at the .05 level.

Also unlike 2004, the duration of unemployment no longer varies by industry. Among the industry groups with more than 15 respondents, the longest duration of unemployment is among those who were employed in the consulting, where the mean was 150 weeks of unemployment. The next longest duration was in the electrical/electronic manufacturing industry (mean of 112 weeks), followed by those who report employment in aerospace (mean of 100 weeks), communications (mean of 97 weeks), computers (mean of 91 weeks), and defense (mean of 84 weeks). There are too few respondents in other industry groups for the reported means to be statistically reliable. The shortest duration of unemployment is in petrochemicals (45 weeks), but this is based on 2 respondents. These between-industry differences are not statistically significant.

As in 2004, older engineers are not clearly more likely to report that their job search is very difficult than younger engineers. Specifically, when asked whether the search was difficult, the mean age of those who chose that response (52) is not significantly different than those who did not. However, when asked if the search was easy, the mean age of those who said "yes" was 47, while the mean age of those who did not choose this response was 52. Although few respondents report an easy search (11 out of 274), the difference in mean ages is not significant beyond the conventional level of .05.

There could be a relation between the reported ease of the job search and duration of unemployment. However, the reported difficulty of job search and duration of unemployment do not seem to be related at all. The mean weeks of unemployment for those who report a very difficult search is 100; while the mean for those who did not select this response option is 97 weeks. This difference is not statistically significant. By contrast, among the few respondents who reported that it was easy to find a new job, the duration of unemployment was 37 weeks, compared to 102 weeks for those who did not choose this response. This difference is significant at the .02 level, which is consistent with common sense view that people who were only unemployed for a short period of time found it easier to find a new job.

Respondents were asked to check whether or not they perceived various factors as barriers to their re-employment. We have already seen that age was the most frequently selected among the nine possible barriers listed. More importantly, older engineers were significantly more likely to cite age as a barrier than younger engineers. Those who cited age as a barrier averaged 54 years, compared to a mean of 45 years for those who did not regard age as a barrier ( $p < 0.0001$ ). However, unlike 2004, those who report age as a barrier do not face longer spells of unemployment (102 weeks) than those who do not (92 weeks). This difference is not significant.

Younger respondents are only slightly more likely to be optimistic about the long-term outlook for engineers than older ones. Those who see an excellent outlook average 51 years. Those who see the outlook as good also average 51 years; and those who see the outlook as fair or poor average 52 and 54 years, respectively. The differences are not significant at the conventional level of .05.

While age may not be consistently correlated with attitudes and perceptions, it remains associated with an outcome. As in the previous surveys, older respondents report significantly more weeks of unemployment than younger respondents. Specifically, for each additional year of age, unemployment goes up by 1.9 weeks ( $p < 0.002$ ). (In 2004, the corresponding statistic was 1.4 weeks.)

## Multivariate Analysis of Age and the Survey Responses

Results indicate that, when other factors (experience, education, industry, method of job search, labor market status, etc.) are held constant in a multiple regression of duration of unemployment on age, the relation between age and unemployment is even stronger than in the bivariate analysis. (This was also the case in 2004). Specifically, controlling for the variables in the regression, for each additional year of age, unemployment goes up by 2.8 weeks ( $p < .04$ ). While significant, the small sample ( $N=202$  cases with no missing values) makes the range fairly large, from 0.2 - 5.3 weeks, even with a 95 percent confidence interval. (In the bivariate analysis, the estimate was only 1.9 weeks.) Unlike the results in 2004, years of professional experience do not have an independent, countervailing effect on the duration of unemployment. Specifically, when other factors in the model (including age) are held constant, each additional year of experience has no significant effect on the duration of unemployment, but the sign is in the expected negative direction. Similarly, education, measured as an ordinal variable equaling 1 for those whose highest degree is a Bachelor's, 2 for those whose highest degree is a Master's, and 3 for those whose highest degree is a Ph.D., has no significant effect, but the sign is also in the expected negative direction. This is also true for those who are voluntarily unemployed or retired. When other variables are held constant, retirees do not report significantly different weeks of unemployment than those who are actively on the job market. Compared to the base category, the computer industry, respondents employed in electrical/electronic services report 63 fewer weeks of employment ( $p < 0.004$ ). There is some evidence that respondents in consulting report 54 more weeks of unemployment than those in the reference computer industry, but the statistical certainty is marginal, since the significance level is only about 0.07. With two exceptions, respondents' report that they used a particular job search technique (regardless of their subjective rating of the effectiveness of the technique) had no significant impact on the actual duration of unemployment. Using outplacement services is one exception. Controlling for the other variables in the regression, respondents who reported use of outplacement services reported 38 fewer weeks of unemployment than those who did not make use of these services ( $p < 0.03$ ). The other exception is job fairs. Respondents who use job fairs report 37 more weeks of unemployment than those who do not ( $p < 0.02$ ). Respondents were asked whether their employer offered outplacement services, retraining opportunities, severance pay, extended benefits. According to the multivariate results, with one exception, these efforts by employers had no significant effect (positive or negative) on the actual duration of unemployment. Outplacement services are the interesting exception; respondents who worked for employers that offered these services report 52 more weeks of unemployment than those whose employers did not offer outplacement ( $p < 0.008$ ). However, we saw above that using outplacement services reduces the duration of employment, so the seemingly adverse effect of outplacement reflects the experience of those who chose not to use the outplacement services that their employers offered. Overall, the smaller number of respondents in the 2006 report, compared to the numbers in previous reports, makes the results from this multivariate analysis questionable, with one important exception. The 2006 results mirror consistent results from each of the previous surveys: controlling for other variables in the regression, including experience and education, age statistically and substantively increases the duration of unemployment. It remains uncertain whether this reflects age, or variables that are omitted from the survey but may be correlated with age, such as maintaining technical competence or other productivity-related factors in rapidly changing fields.

## **Selected Comparisons of the 2006 Responses to 1995, 1996, 1998, 2002 and 2004 Survey Responses**

There are some striking differences, and some striking similarities, among the 1995, 1996, 1998, 2002, 2004 and 2006 survey responses. Further, there is evidence that the situation for unemployed engineers has gotten both better and worse. (Testing the differences for statistical significance is beyond the scope of this basically descriptive exercise.) For example, with respect to the employment status of respondents to the five previous surveys: in 1995, 20 percent reported being re-employed full-time as an engineer; in 1996, 19 percent so reported; in 1998, 17 percent so reported; in 2002, 24 percent reported being re-employed full-time as an engineer, and the same statistic in 2004 was 26 percent. The corresponding statistic in 2006 is 19 percent. The respondents who reported being employed part-time or self-employed were 15 percent in 1995, 13 percent in 1996, 16 percent in 1998, 9 percent in 2002, and 17 percent in 2004. The corresponding statistic in 2006 is 12 percent. In 1995, 48 percent were involuntarily unemployed; in 1996, 49 percent were involuntarily unemployed; in 1998, 46 percent were; in 2002, 54 percent were; in 2004, 42 percent were; and in 2006, 47 percent were.

A clear trend, however, emerges in the industry of former employment, as well as in characteristics related to the industry of employment. In 1995, 20 percent reported employment in defense, and 16 percent reported employment in aerospace; these industries were (and are) relatively dependent on government funds. In 1996, 11 percent were employed in defense, and 15 percent in aerospace. In 1998, with further cutbacks in aerospace, 11 percent report former employment in defense, but only 8 percent in aerospace. In 2002 and 2004, this downward trend seemed to level at 5 percent in defense, and 4 percent in aerospace. In 2006, 7 percent report employment in aerospace, and 6 percent in defense. In 2004, more than half of the respondents (55 percent) were engaged in communication, computer, and electrical/electronic manufacturing industry. In 2006, the corresponding statistic is 49 percent, but these three industries remain the largest employers of the respondents to this survey. Further, in 1995, 33 percent reported that their former jobs did not depend at all on government funding; in 1996, 42 percent so reported; in 1998, 40 percent reported no dependence on government funding, in 2002 the corresponding percent was 55 percent; and in 2004, this percentage increased further to 59 percent. In 2006, the corresponding statistic dropped to 52 percent. In a similar vein, in 1995, 30 percent reported jobs that were totally dependent on government funding; in 1996, 23 percent so reported; in 1998, 24 percent so reported; in 2002, only 10 percent reported these as former jobs; and the corresponding percent in 2004 was 9 percent. In 2006, 13 percent report that their most recent job was totally dependent on government funds.

The reasons for the respondents' layoff roughly reflect the larger economy. In 1995, 58 percent cited business downturn as the reason for their layoff; and the corresponding percentages in 1996, 1998, 2002, and 2004 were 46 percent, 31 percent, 76 percent and 62 percent respectively. In 2006, the corresponding statistic continues to drop to 50 percent. Compared to responses in 2004, there is little change in the percent that cite the transfer of their work as the reason for being laid off. In 2004, 7 percent cited transfer of work to another domestic location as the reason for being laid off; in 2006, the corresponding percentage is 10 percent. In 2004, 15 percent cited transfer of work to an offshore location as the reason for layoff; in 2006, the corresponding statistic remains at 16 percent. (Responses to surveys before 2004 did not distinguish between domestic and off-shore transfers of work.)

Another trend is that employers are providing much less service for laid-off workers than they did before. Severance was provided in only 51 percent of the cases (compared with 54 percent in 2004

and 90 percent in 2002) and extended benefits in only 30 percent of the cases (compared with 27 percent in 2004 and 48 percent in 2002). Outplacement help was provided to 28 percent of respondents (38 percent in 2004 and 56 percent in 2002) and retraining was offered to only 6 percent of respondents (4 percent-5 percent in 2002 and 2004).

The mean duration of unemployment is 99 weeks in 2006, which is considerably larger than that reported previously. In 2004, the mean was 82 weeks, which is considerably larger than that reported in the 2002 survey (49 weeks). It is comparable to levels reported in three other previous surveys: the mean duration was 103 weeks in 1998, 84 weeks in 1995 and 92 weeks in 1996. The median duration of unemployment is also comparatively large in 2006, at 62 weeks. The 2004 median unemployment spell was 68 weeks, compared to a 2002 median of 38 weeks, 65 weeks in 1998, 57 weeks in 1995, and a median reported as "between 52-78" in 1996. Interestingly, the percentage who reported that it is "very difficult" to find a new job is slightly less than in 2004. In 2006, the percentage is 57 percent; the corresponding percentage in 2004 and 2002 was 66 percent, which is less than in 1998 (71 percent), 1996 (76 percent) or 1995 (85 percent). Respondents in 2006 view the long term demand for engineers about the same as they did in 2004. In 2006, 37 percent see the outlook as "good", similar to 33 percent who viewed the outlook as "good" in 2004. These compare to 45 percent in 2002, 47 percent in 1998, 25 percent in 1996, and 23 percent in 1995. There is slightly less pessimism in 2006, when 18 percent see the outlook as "poor", since 24 percent view the outlook as poor in 2004, compared to 13 percent in 2002, 21 percent in 1998, 35 percent in 1995, and 37 percent in 1996.

In 2002, 30 percent reported that they would not recommend engineering to their son and daughter. In 2004, this increased to 41 percent. But in 2006 it decreased to 35 percent.

Email access has become increasingly available. In 1995, 43 percent reported having email; in 1996, 60 percent had Internet access. In 1998, only 12 percent reported no access to email, which means that 88 percent did have some form of email. By 2002, 69 percent reported full access to the Internet, and 99 percent had email access. In both 2004 and 2006, almost 100 percent had access to Internet or email, and 64 percent reported full access in 2004 and 66 percent report full access in 2006.

Results from 2006 indicate that, when numerous other factors are held constant, each additional year of age adds about 2.8 weeks to the duration of unemployment. In 2004, the comparable statistic showed that, when numerous other factors are held constant, each additional year of age added about 2.3 weeks to unemployment. This may indicate that age has a less pernicious effect in recent years (since 2000) than it did in the late 1990s, when these surveys first began. In 2002 and 1998, each additional year resulted in 3 additional weeks of unemployment when other factors were held constant, compared to 7 weeks in 1996 and 5 weeks in 1995.

Before 2002, Internet access had a significant effect in reducing the duration of unemployment. By 2002, it no longer had significant impact, undoubtedly because virtually all respondents have access. The same is true in 2004: having full access to the Internet has no significant impact on the duration of unemployment.

Overall, age appears to have a persistent effect on the duration of unemployment, but it cannot be determined from these surveys whether that is attributable to productivity differences, price/wage differences, the domestic supply of engineers, age discrimination, or some other factor.

## Employment Outcomes, Job Search Techniques, Industry, Re-employment Services, and Education: Some Additional Contingency Table Results

It is possible that there is an association between employment outcomes and job search techniques. In most cases, the number of responses is too small for a reliable picture to emerge. We have already seen that respondents believe that most job search techniques are not very effective, with the exception of networking. The percent who rate a job search technique as “effective” (that is, in the top 3 of 9 categories) does not differ much by employment status, but some differences are marginally significant. Those who are re-employed as a professional engineer are marginally more likely than any other respondent group to rate a head-hunter, outplacement services, and the internet as effective job search techniques. Self-employed respondents are the most likely to rate job fairs as effective. Networking is not rated significantly different by those with different employment outcomes, however.

It is important not to confuse the correlation between employment status and the rating of the use of internet job listings, or any other job search technique, as evidence of a causal connection. Association or correlation between two variables may result from a common cause of both variables. For instance, unmeasured “ability” may determine both the success with which people network and their current employment status. So networking may have little or no causal impact. (Networking appears from the regression to have no impact on the duration of unemployment even when other variables are held constant.) Nonetheless, the problem of unmeasured common causes still makes it hazardous to draw any causal conclusions about the effectiveness of networking. Further, the small number of cases in each cell of the contingency table makes any firm conclusion about the association between these variables somewhat unreliable.

There is no significant difference in the mean weeks of unemployment between those who rate sending out resumes as “effective” (in the top 3 of 9 levels) compared to not effective. The same pattern of “no difference” is true for answering ads; using a head hunter; using an outplacement service; hiring a private consultant; going to job fairs; and even networking. Only internet job listings is the exception. Among those who rate internet job listings as effective, the mean weeks of unemployment is 43, compared to 181 among those who rate networking as less effective ( $p < .04$ ). However, the multivariate analysis suggests that outplacement services may be effective, once other factors are held constant.

Different industries appear to offer significantly different mixes of re-employment services, according to the respondents. Focusing on the industries representing the largest groups of respondents (communications, electrical/electronic manufacturing, and defense), about 43-44 percent of respondents who worked in communications and electrical/electronic manufacturing reported that their employer offered outplacement services when they were laid off. This is significantly more than that reported by respondents in other industries ( $p < .05$ ). These two industries were also the most likely to offer severance, with 58 percent and 71 percent of respondents in communications and electrical/electronic manufacturing, respectively, so reporting. This is higher than in other industries ( $p < .05$ ). Respondents in defense and electrical/electronic manufacturing are more likely than respondents in other industries to report that they were offered extended benefits when they were laid off (41 percent and 48 percent, respectively,  $p < .03$ ).

The duration of unemployment does not vary significantly according to the type of reemployment opportunities offered by the employer, with one exception. The duration of unemployment

is significantly associated with whether or not the employer offered outplacement services, but in a negative direction: when respondents report their previous employer offered outplacement service, the mean duration of unemployment is 125 weeks, compared to 88 weeks for respondents who indicate that their employer did not offer outplacement services ( $p < .003$ ).

Nearly all respondents (96 percent) report that it is not easy to find a new job. This proportion does not vary significantly by the industry in which the respondent worked. Nor does the report about not being easy to find a new job vary significantly by the job search technique the respondent finds most effective. Specifically, the reported ease of finding a job does not vary with the rating of the effectiveness of sending out resumes, answering ads, using a head hunter, using outplacement services, using a private consultant, or going to job fairs. Even networking and using internet job listing make no significant difference in this case.

In the bivariate comparison of means, the duration of unemployment does not differ significantly with the highest degree. The mean weeks of unemployment for those with a BS/BSEE or other 4-year degree is about 90; the corresponding statistic for those whose highest degree is the MS/MSEE is 99 weeks, and for those with a PhD, the mean is 103 weeks, although the number is low.

There is also no significant two-variable association between current employment status and highest degree. About 21 percent of those who report that a BS or BA is their highest degree report being re-employed as a full-time technical professional, as do 18 percent of those who report the masters' as their highest degree, and 22 percent of those with the PhD as their highest degree (where the small number of respondents makes this potentially unreliable). Similarly, regardless of degree status, the same proportion (44 percent-48 percent) report involuntary unemployment.

There is no significant association between the industry of former employment and the relative frequency with which respondents indicated that transfer of work overseas was the reason given for being laid off.

# IEEE-USA Employment Survey 2006

## Frequency Charts (minus Verbatim Responses)

Total number of responses collected: 333 – 19% response rate

**1: Check the response that best describes your current employment situation:**








(Respondents could only choose a single response)

Response	Chart	Frequency	Count
Re-employed full time as a technical professional		18.6%	55
Employed as other than a technical professional		2.0%	6
Employed part time		4.7%	14
Self-employed		7.1%	21
Unemployed, voluntarily		8.1%	24
<b>Unemployed, involuntarily</b>		<b>46.6%</b>	<b>138</b>
Retired, voluntarily		6.4%	19
Retired, involuntarily		6.4%	19
Not Answered			2
		Mean	4.818
		Standard Deviation	2.168
		Valid Responses	296
		Total Responses	298

**2: In what industry are/were you employed?**





(Respondents could only choose a single response)









Response	Chart	Frequency	Count
Aerospace		7.1%	21
Automotive		0.7%	2
Communications		12.2%	36
<b>Computers</b>		<b>22.1%</b>	<b>65</b>

Consulting		5.8%	17
Defense (other than aerospace)		5.8%	17
Education		2.7%	8
Electrical/electronic services		3.7%	11
Electrical/electronic manufacturing		14.3%	42
Medical		3.7%	11
Petrochemicals		0.7%	2
Transportation		1.0%	3
Utilities		4.8%	14
Other		15.3%	45
Not Answered			4
		<b>Mean</b>	<b>7.082</b>
		<b>Standard Deviation</b>	<b>4.190</b>
		<b>Valid Responses</b>	<b>294</b>
		<b>Total Responses</b>	<b>298</b>

### 3 (No. Engineers): Estimate the number of engineers at your most recent location of employment:






(Respondents were limited to brief text responses)

Response	Chart	Frequency	Count
0		3.7%	10
1		4.9%	13
2		3.0%	8
3		3.0%	8
4		1.1%	3
5		3.4%	9
6		2.2%	6
7		0.7%	2
8		1.9%	5
10		4.1%	11
12		1.9%	5
15		2.6%	7

20		3.4%	9
25		2.6%	7
30		1.9%	5
35		0.7%	2
40		1.9%	5
<b>50</b>		<b>6.7%</b>	<b>18</b>
60		0.7%	2
70		0.7%	2
75		1.1%	3
100		4.5%	12
120		1.9%	5
150		2.6%	7
200		3.0%	8
250		1.5%	4
300		3.7%	10
400		1.1%	3
500		6.4%	17
1000		4.1%	11
1200		1.1%	3
1500		0.7%	2
2000		3.4%	9
2500		0.7%	2
3000		1.9%	5
4000		1.1%	3
5000		1.1%	3
6000		0.7%	2
10000		0.7%	2
20000		1.1%	3
Other Responses		6.0%	16
		<b>Valid Responses</b>	<b>267</b>
		<b>Total Responses</b>	<b>267</b>

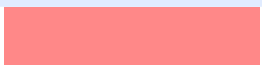

#### 4: To what extent was your most recent position dependent on government grants, contracts, or funds?

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
Totally		13.3%	39
Primarily		6.8%	20
Somewhat		7.8%	23
Very little		20.4%	60
<b>None</b>		<b>51.7%</b>	<b>152</b>
Not Answered			4
		Mean	3.905
		Standard Deviation	1.435
		<b>Valid Responses</b>	<b>294</b>
		<b>Total Responses</b>	<b>298</b>

#### 5: Were you laid off from your last position?

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
<b>Yes</b>		<b>66.9%</b>	<b>196</b>
No		33.1%	97
Not Answered			5
		Mean	1.331
		Standard Deviation	0.471
		<b>Valid Responses</b>	<b>293</b>
		<b>Total Responses</b>	<b>298</b>

## 6: If you were laid off, what reason(s) did the company give? (Select all that apply.)

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
<b>Business downturn (actual or anticipated)</b>		<b>30.0%</b>	<b>100</b>
Merger or acquisition		4.5%	15
Efficiency or productivity improvements		6.9%	23
Transfer of work (another domestic location)		5.7%	19
Transfer of work (offshore location)		9.6%	32
Plant or office obsolescence		0.9%	3
Other		14.4%	48
		<b>Valid Responses</b>	<b>201</b>
		<b>Total Responses</b>	<b>201</b>



## 7: Were the layoffs

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
Across the board?		40.0%	76
<b>Targeted at specific functions or units?</b>		<b>60.0%</b>	<b>114</b>
Not Answered			11
		Mean	1.600
		Standard Deviation	0.491
		<b>Valid Responses</b>	<b>190</b>
		<b>Total Responses</b>	<b>201</b>




### 8: Do you want to stay in or move out of your primary area of technical competence?

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
<b>Stay in</b>		<b>71.4%</b>	<b>207</b>
Move out of		28.6%	83
Not Answered			7
		Mean	1.286
		Standard Deviation	0.453
		<b>Valid Responses</b>	<b>290</b>
		<b>Total Responses</b>	<b>297</b>

### 9: Do you contemplate returning to school full or part time?

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
Full Time		11.9%	35
Part Time		27.3%	80
<b>No</b>		<b>60.8%</b>	<b>178</b>
Not Answered			4
		Mean	2.488
		Standard Deviation	0.700
		<b>Valid Responses</b>	<b>293</b>
		<b>Total Responses</b>	<b>297</b>

## 10: Do you contemplate moving out of the engineering profession entirely?





(Respondents could only choose a single response)




Response	Chart	Frequency	Count
Yes		34.9%	102
<b>No</b>		<b>65.1%</b>	<b>190</b>
Not Answered			5
		Mean	1.651
		Standard Deviation	0.478
		Valid Responses	292
		Total Responses	297

## 11 (Weeks): How many weeks have you been (or were you) unemployed?

(Respondents were limited to brief text responses)





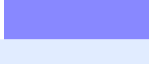
Response	Chart	Frequency	Count
1		0.7%	2
4		1.9%	5
5		1.1%	3
6		0.7%	2
10		0.7%	2
12		1.9%	5
16		2.2%	6
20		1.5%	4
24		2.6%	7
25		0.7%	2
26		1.5%	4
28		1.1%	3
30		2.2%	6
34		0.7%	2

36		1.5%	4
38		0.7%	2
40		1.1%	3
45		1.1%	3
46		0.7%	2
48		1.9%	5
50		2.2%	6
52		6.7%	18
54		1.1%	3
55		1.1%	3
60		5.6%	15
62		0.7%	2
64		0.7%	2
65		0.7%	2
70		1.1%	3
73		0.7%	2
78		0.7%	2
80		2.6%	7
85		0.7%	2
100		4.4%	12
104		0.7%	2
110		1.1%	3
120		0.7%	2
124		0.7%	2
125		1.1%	3
135		0.7%	2
150		4.4%	12
156		0.7%	2
160		0.7%	2

168		0.7%	2
170		0.7%	2
175		0.7%	2
180		1.1%	3
182		1.1%	3
200		4.4%	12
250		3.3%	9
260		0.7%	2
500		1.9%	5
Other Responses		<b>18.1%</b>	<b>49</b>
		<b>Valid Responses</b>	<b>270</b>
		<b>Total Responses</b>	<b>270</b>

## 12: When you left, did your previous employer provide: (Select all that apply.)

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
Outplacement services		25.2%	84
Retraining opportunities		5.4%	18
<b>Severance</b>		<b>45.6%</b>	<b>152</b>
Extended benefits		26.4%	88
None of the above		34.8%	116
		<b>Valid Responses</b>	<b>297</b>
		<b>Total Responses</b>	<b>297</b>

**13: When you were employed, which benefits were paid or partially paid by your employer? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
Life insurance		51.1%	170
401K plan		56.8%	189
Pension plan		28.2%	94
<b>Healthcare insurance</b>		<b>71.2%</b>	<b>237</b>
Dental insurance		59.8%	199
Visioncare insurance		41.7%	139
None of the above		14.4%	48
		<b>Valid Responses</b>	<b>295</b>
		<b>Total Responses</b>	<b>295</b>

**14: When you were reemployed, which benefits were paid or partially paid by your employer? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
Life insurance		10.8%	36
401K plan		12.3%	41
Pension plan		4.8%	16
Healthcare insurance		17.1%	57
Dental insurance		13.8%	46
Visioncare insurance		10.5%	35
<b>None of the above</b>		<b>37.8%</b>	<b>126</b>
		<b>Valid Responses</b>	<b>295</b>
		<b>Total Responses</b>	<b>295</b>

**15: While you were/you are unemployed, which benefits are you funding yourself? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
Life insurance		35.1%	117
401K plan		9.6%	32
Pension plan		6.9%	23
<b>Healthcare insurance</b>		<b>59.2%</b>	<b>197</b>
Dental insurance		35.1%	117
Visioncare insurance		17.7%	59
None of the above		16.5%	55
		<b>Valid Responses</b>	<b>295</b>
		<b>Total Responses</b>	<b>295</b>

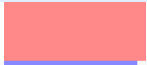

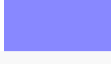
**16: Describe your employment search and the results: (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
<b>Very difficult to find new job</b>		<b>49.2%</b>	<b>164</b>
Fairly easy to find a new job		3.6%	12
Offer fell into my lap		3.3%	11
Found a great job		4.8%	16
Found an adequate job		6.0%	20
Anticipate a raise		2.7%	9
Will have to take a cut in pay		16.2%	54
Have not yet found a new job		37.2%	124
Other		13.2%	44
		<b>Valid Responses</b>	<b>289</b>
		<b>Total Responses</b>	<b>289</b>



### 17: If you have/had a child, would you recommend to your son/daughter to go into your profession?

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
<b>Yes</b>		<b>36.8%</b>	<b>102</b>
No		35.0%	97
Not sure		28.2%	78
Not Answered			12
		Mean	1.913
		Standard Deviation	0.803
		<b>Valid Responses</b>	<b>277</b>
		<b>Total Responses</b>	<b>289</b>

### 18: Are you aware of any of IEEE-USA's employment assistance services?

(Respondents could only choose a single response)











Response	Chart	Frequency	Count
Yes		47.9%	135
<b>No</b>		<b>52.1%</b>	<b>147</b>
Not Answered			7
		Mean	1.521
		Standard Deviation	0.500
		<b>Valid Responses</b>	<b>282</b>
		<b>Total Responses</b>	<b>289</b>

**19: Rate how well various job-search techniques work for you. Please assign a rating on a scale from 1 to 9, where 1 represents “very effective” and 9 represents “very ineffective”.**

		Very	2	3	4	5	6	7	8	Very ineffective 9	Did not use	Total	Mean	Std Dev
Sending out resumes	Count	14	9	15	13	32	14	40	30	<b>68</b>	35	<b>270</b>	6.404	2.486
	% by Row	5.2%	3.3%	5.6%	4.8%	11.9%	5.2%	14.8%	11.1%	<b>25.2%</b>	13.0%	<b>100.0%</b>		
Answering ads	Count	9	8	15	14	33	18	44	33	<b>62</b>	37	<b>273</b>	6.479	2.313
	% by Row	3.3%	2.9%	5.5%	5.1%	12.1%	6.6%	16.1%	12.1%	<b>22.7%</b>	13.6%	<b>100.0%</b>		
Using a headhunter	Count	10	10	10	23	25	22	28	22	35	<b>82</b>	<b>267</b>	5.924	2.385
	% by Row	3.7%	3.7%	3.7%	8.6%	9.4%	8.2%	10.5%	8.2%	13.1%	<b>30.7%</b>	<b>100.0%</b>		
Using outplacement services	Count	2	6	4	8	20	20	22	17	37	<b>126</b>	<b>262</b>	6.625	2.115
	% by Row	0.8%	2.3%	1.5%	3.1%	7.6%	7.6%	8.4%	6.5%	14.1%	<b>48.1%</b>	<b>100.0%</b>		
Hiring private consultant	Count	1	1	5	1	6	4	3	5	18	<b>215</b>	<b>259</b>	6.795	2.426
	% by Row	0.4%	0.4%	1.9%	0.4%	2.3%	1.5%	1.2%	1.9%	6.9%	<b>83.0%</b>	<b>100.0%</b>		
Going to job fairs	Count	4	7	8	9	18	17	14	32	64	<b>90</b>	<b>263</b>	6.936	2.293
	% by Row	1.5%	2.7%	3.0%	3.4%	6.8%	6.5%	5.3%	12.2%	24.3%	<b>34.2%</b>	<b>100.0%</b>		
Networking	Count	<b>36</b>	<b>36</b>	33	21	32	21	19	14	23	30	<b>265</b>	4.379	2.576
	% by Row			12.5%	7.9%	12.1%	7.9%	7.2%	5.3%	8.7%	11.3%	<b>100.0%</b>		
Internet job listings	Count	17	11	18	28	35	28	30	28	<b>45</b>	30	<b>270</b>	5.779	2.459
	% by Row	6.3%	4.1%	6.7%	10.4%	13.0%		11.1%	10.4%	<b>16.7%</b>	11.1%	<b>100.0%</b>		
Other	Count	6	3	3	3	15	3	3	5	10	<b>107</b>	<b>158</b>	5.431	2.640
	% by Row	3.8%	1.9%	1.9%	1.9%	9.5%	1.9%	1.9%	3.2%	6.3%	<b>67.7%</b>	<b>100.0%</b>		
<b>Total</b>	Count	<b>99</b>	<b>91</b>	<b>111</b>	<b>120</b>	<b>216</b>	<b>147</b>	<b>203</b>	<b>186</b>	<b>362</b>	<b>752</b>	<b>2287</b>	N/A	N/A
	% by Row	<b>4.3%</b>		<b>4.9%</b>	<b>5.2%</b>	<b>9.4%</b>	<b>6.4%</b>	<b>8.9%</b>	<b>8.1%</b>	<b>15.8%</b>	<b>32.9%</b>	<b>100.0%</b>		





**20: Check any of the following that you view as personal major barriers to employment or re-employment? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
<b>Age</b>		<b>62.8%</b>	<b>209</b>
Sex		8.1%	27
Ethnic background		15.6%	52
Disability		6.0%	20
Educational background		8.7%	29
Area of technical competence		27.6%	92
Geographic preferences		30.6%	102
National economic conditions		24.3%	81
Decrease in government spending		6.9%	23
Other		15.6%	52
		<b>Valid Responses</b>	<b>289</b>
		<b>Total Responses</b>	<b>289</b>







**21: How do you assess the long term demand for engineers?**

(Respondents could only choose a single response)

Response	Chart	Frequency	Count
Excellent		13.2%	37
<b>Good</b>		<b>36.4%</b>	<b>102</b>
Fair		32.5%	91
Poor		17.9%	50
Not Answered			9
		<b>Mean</b>	<b>2.550</b>
		<b>Standard Deviation</b>	<b>0.934</b>
		<b>Valid Responses</b>	<b>280</b>
		<b>Total Responses</b>	<b>289</b>

## 23 (Age): What is your age?

(Respondents were limited to brief text responses)











Response	Chart	Frequency	Count
24		0.7%	2
25		0.7%	2
31		0.7%	2
32		0.7%	2
33		1.1%	3
35		1.1%	3
36		1.4%	4
37		1.8%	5
38		1.1%	3
39		1.1%	3
40		1.1%	3
41		1.4%	4
42		1.8%	5
43		1.8%	5
44		1.8%	5
45		1.4%	4
46		0.7%	2
47		4.3%	12
48		3.3%	9
49		2.5%	7
<b>50</b>		<b>8.7%</b>	<b>24</b>
51		3.3%	9
52		5.4%	15
53		2.9%	8
54		2.9%	8
55		3.6%	10

56		1.8%	5
57		4.0%	11
58		5.1%	14
59		5.8%	16
60		8.3%	23
61		5.4%	15
62		4.0%	11
63		1.8%	5
64		1.1%	3
65		1.1%	3
66		1.4%	4
69		0.7%	2
Other Responses		1.8%	5
		<b>Valid Responses</b>	<b>276</b>
		<b>Total Responses</b>	<b>276</b>

## 24 (Years): How many years of professional and managerial experience do you have?

(Respondents were limited to brief text responses)

Response	Chart	Frequency	Count
0		2.2%	6
1		1.1%	3
10		3.3%	9
10+		0.7%	2
11		1.1%	3
14		1.1%	3
15		3.6%	10
16		0.7%	2
18		1.1%	3
19		0.7%	2

2		1.1%	3
20		8.0%	22
20+		1.1%	3
21		1.5%	4
22		2.5%	7
23		1.8%	5
24		3.3%	9
<b>25</b>		<b>9.8%</b>	<b>27</b>
26		2.2%	6
27		1.8%	5
28		3.3%	9
29		1.5%	4
3		0.7%	2
30		9.5%	26
30+		1.1%	3
31		1.5%	4
32		4.0%	11
33		1.5%	4
34		1.8%	5
35		5.1%	14
36		4.7%	13
37		1.1%	3
38		1.8%	5
40		3.3%	9
42		0.7%	2
5		2.2%	6
8		1.5%	4
9		1.1%	3
Other Responses		5.1%	14
		<b>Valid Responses</b>	<b>275</b>
		<b>Total Responses</b>	<b>275</b>

**25: What degree(s) do you hold? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
<b>BS/BSEE/other Baccalaureate</b>		<b>64.6%</b>	<b>215</b>
MS/MSEE/other Master's		39.6%	132
Ph.D.		9.6%	32
None		1.8%	6
Other		10.5%	35
		<b>Valid Responses</b>	<b>284</b>
		<b>Total Responses</b>	<b>284</b>

**26: Do you have access to the Internet? (Select all that apply.)**

(Respondents were allowed to choose multiple responses)

Response	Chart	Frequency	Count
<b>Home</b>		<b>77.2%</b>	<b>257</b>
Work		23.7%	79
Full Access		56.2%	187
E-mail only		1.8%	6
None		0.3%	1
		<b>Valid Responses</b>	<b>284</b>
		<b>Total Responses</b>	<b>284</b>



1828 L Street, NW, Suite 1202  
Washington, D.C. 20036  
+1 202 785 0017  
**[www.ieeeusa.org](http://www.ieeeusa.org)**